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INDEX TO ANNOUNCEMENTS.

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INDIAN MEDICAL SERVICE.

SPECIAL RECRUITMENT, 1922-3.

For not more than 30 European Officers to be appointed in the immediate future, special terms are offered, including gratuities of £1,000 after 5 years' service, together with free return passages for those who no longer desire to remain in the service. Otherwise the terms will be as detailed below.

APPOINTMENT.

The Secretary of State for India announces that vacancies in the Indian Medical Service continue to be filled by direct appointment.

Candidates must be under thirty-two years of age at the time of application, and must possess qualifications registrable in Great Britain and Ireland under the Medical Acts now in force.

CAREERS.

The I.M.S. offers a variety of service to suit every taste. At the beginning of his career an officer is employed on the military side, which has medical charge of the Indian Army. He may, if he chooses, remain in military employ for the whole of his career; he will in that case hold a post on the staff of a Station Hospital, or a specialist post, or a post on the administrative staff of the Army. Promotion is on a time scale up to the rank of Lieutenant-Colonel, and by selection to the ranks of Colonel and Major-General. Or he may apply after 2 years' Indian service for transfer to the civil side, from which appointments are made to Civil Surgeoncies, established at the principal civil centres to provide for the medical needs of civil officials and for general medical administrative purposes, to specialist (*e.g.*, sanitary and bacteriological) services, to research posts, and to professorships at the Medical Schools.

PAY.

The rates of pay for European officers in the Service have been considerably enhanced, and are as follows:—

	Rs. per mensem (Consolidated).
Lieutenants	650
Captains	800 for 3 years. 950 for 3 years. 1,050 for 3 years, or until promotion to the rank of Major.
Majors	1,200 for 3 years. 1,350 for 3 years. 1,500 for 2 years, or until promotion to Lt.-Col.
Lieut.-Colonels	1,750 for 3 years. 1,850 in 24th and 25th years of service. 1,950 from 26th year of service. 2,100 when selected for increased pay.

The above rates include an overseas allowance of Rs. 150 per mensem for the first 6 years, Rs. 200 per mensem for the next 6 years, and thereafter Rs. 250 per mensem, which will be admissible to officers of non-Indian domicile only.

EXTRAS.—In addition to the above rates, officers in Military employment, when in charge of Station Hospitals, draw a special allowance. On the civil side there are professorial, bacteriological, and sanitary appointments carrying special enhanced rates. Special high rates of pay are attached to the numerous administrative appointments open to officers in both branches of the Service.

PRIVATE PRACTICE.

Except in the administrative grades on the military side, and in certain special appointments on the civil side, officers may take private practice so long as it does not interfere with the proper discharge of their Government duties.

WAR SERVICE.

Service during the War as a medical or combatant officer or in a position usually filled by an officer counts towards promotion and pension so long as the rights of Officers who have entered by competition are not interfered with.

PENSIONS.

The rates of pensions have been improved and are as follows:—

Service.	Rate Per Annum.
After 17 years	£400
„ 18 „	£430
„ 19 „	£460
„ 20 „	£500
„ 21 „	£540
„ 22 „	£580
„ 23 „	£620
„ 24 „	£660
„ 25 „	£700
„ 26 „	£750
„ 27 „	£800

There are additional pensions ranging from £125 to £350 per annum for officers who have held high administrative appointments.

PASSAGES.

Officers on appointment are, when possible, provided with passage to India by transport; when such accommodation is not available, passage at the public expense is provided by private steamer or passage allowance is granted if preferred. The wives and families of officers who are married prior to the date of the officer's appointment to the Indian Medical Service will also be provided with passage to India at the public expense under the same conditions as those applicable to the officers themselves.

During the course of their service officers of the Indian Medical Service in military employ are entitled to passage from India to the United Kingdom and back whenever they are granted sick leave by a medical board in India. If married, their wives and families will also be granted passages to accompany them.

INCREASED CADRE.

Formerly the allowance for furlough was 20 %. This has now been increased to 25 %. Previously there was no allowance for study leave; now the cadre has been increased 2½ % for study leave. Whilst on study leave there are special allowances.

INCREASED OPPORTUNITIES FOR RESEARCH.

There is a Special School of Tropical Medicine in Calcutta, and the founding of a Research Institute in Delhi is in progress.

Further particulars can be obtained on application to the SECRETARY, MILITARY DEPARTMENT, INDIA OFFICE, WHITEHALL, LONDON, S.W.1. Letters should be marked "Recruitment for I.M.S."

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CONTENTS (*continued*).

Ambulatory Treatment of Fracture of the Limbs; Tuberculous and Arthritic Disease of Joints.

By C. A. HOEFFTCKE,
7, HARLEY STREET, W.1.

The following description by the patient, a medical man, shows the result obtained by the use of Hoefftcke's Ambulatory Treatment with his Extension Appliances in one of the severest Rheumatoid Arthritis cases; where nearly all joints were attacked.

Dr. C., aged 50, sudden onset with high temperature of general infection Arthritis.

Treated with vaccines, &c., without results for 18 months, also 9 months at Bath, baths, ionization, &c., under Col. B.'s partner.

Condition after 27 months absolutely incapacitated, bedridden, extreme pain in all joints with muscular spasms on sleeping, knees very swollen, painful and contracted.

Came to London and consulted Dr. H. M., who ordered Hoefftcke's Ambulatory Extension treatment.

Cast for splints taken in January, 1916, and limbs put up in plaster to lessen muscular spasm for a fortnight, which it did very effectively.

Splints applied, angle of contraction 55 degrees knee-bar and elastic traction straightened out knees completely within six months, during that time I walked about and had less pain the more I walked, no doubt owing to the increased blood supply in the joints and the formation of antibodies in the blood itself.

When the knees were completely straightened out, the elastic traction was substituted for steel bar traction, which gave additional power in the direction of extension of joints when walking.

After wearing the splints for about six months, I could walk a mile with a fair amount of comfort, and muscular power increased accordingly.

After wearing splints two years, elastic traction was discontinued and flexion and extension was normal.

Right splint was taken off June, 1918, and left splint at the end of 1918.

At the commencement of treatment, there was great muscular atrophy, but when splints were taken off the limbs were nearly normal size.

Hands and arms, which were very painful and contracted at beginning of treatment, became more supple as the knees improved.

The splints have now been discarded for two years without recurrence, indeed, with steady improvement in all joints including the upper limbs, I am now (1921) able to walk, run, and even play tennis.

THE PRACTITIONER

JANUARY
1923

Introduction.

By SIR ARTHUR MAYO-ROBSON, K.B.E., C.B., C.V.O., D.Sc., F.R.C.S.

Knight of Grace of the Order of St. John of Jerusalem ; Chevalier of the Légion d'Honneur ; late Member of Council and Vice-President of the Royal College of Surgeons of England ; Emeritus Professor of Surgery in the University of Leeds ; Consulting Surgeon to the Leeds General Infirmary, etc.

THIS Special Number is issued with the idea of helping the men engaged in general practice in those operations which, under certain circumstances of time and place, they may have to perform at any moment. Each section is contributed by an authority on that particular subject. By desire of the Controlling Editor of THE PRACTITIONER, I have read carefully all the articles, and it seems to me that some of the writers have found difficulty in defining what surgical operations are likely to come within the scope of the general practitioner. It appears quite clear, however, that there can be made no hard and fast rule on the matter, which, at present, is solved by the personal equation.

The surgery of the War, of which I had much experience in France, at the Dardanelles, in Egypt, and at Home, was of a type, especially on the field of battle and in the casualty clearing stations, that

from an educational point of view, so far as *operative* surgery is concerned, was almost worse than useless for civil practice, though the lessons capable of being learnt in the War, on methods of wound treatment, on the treatment of compound fractures, and in other branches of surgery, were of great value.

The result of surgical work during the War led many men, on their return home, to take up the idea of combining operative surgery with general practice. This, in the opinion of some of the leaders of the profession, has not been to the advantage of the science and art of surgery, whatever it may or may not have been to the practitioner himself or to the general public.

There are, however, circumstances and times when any medical man must be prepared to do a surgical operation, or to see his patient die. Even in Yorkshire, Lancashire, Westmorland, Cumberland, and other English counties and in Scotland, Wales, and Ireland, there are many districts hours away from any surgical centre, and in countries like Canada, Australia, Africa, and New Zealand, the general practitioner may be hundreds of miles away from the eminent surgical specialists to be found in the big centres of all the Dominions and other countries. Every medical man who goes to practice in out-of-the-way parts of the world should be capable of doing surgical work, and should prepare himself. Accordingly, he must accept, at times, the responsibility of giving his patient the only chance of recovery by performing a surgical operation or accepting the awful alternative of letting the patient die, because he is unable to do what is necessary. The Editor had, doubtless, these conditions in his mind when he planned this Special Number of THE PRACTITIONER.

It has happened to me when travelling in countries far from civilization, to have to afford skilled help to fellow men of various nationalities, and it is aston-

ishing to find what can be done with a sharp clasp knife, with ordinary sewing needles, with boiled thread for ligatures and sutures, with plain boiled water and clean hands, and, as dressings, freshly boiled handkerchiefs held in position by clean puttees as bandages.

Every medical man engaged in general practice should be able to perform any of the ordinary operations required in surgical emergencies, many of which are described under the various sections in this useful volume.

I think no one will disagree with Sir Anderson Critchett, when he advises that operations on the eye of an intraocular character should be left to the surgical expert. His description of certain minor operations will prove most useful in general practice. Of all operations permitting of no delay, laryngotomy or tracheotomy frequently take the lead, and Sir James Dundas-Grant's description of them is most practical and useful. The remainder of his article is filled with useful hints and descriptions of other operations on the throat, nose, and ear, though I think many surgeons, as well as general practitioners, would prefer, where possible, to let the expert perform mastoid operations. Of the surgical emergencies dealt with in Sir D'Arcy Power's short article, not one could be omitted without loss. The "First and Last Kink," by Sir Arbuthnot Lane, is a section as interesting and illuminating as his work on this subject always is, but I cannot think that Sir Arbuthnot is prepared to advise anyone but a surgical expert to undertake so extensive an abdominal operation, requiring so much judgement and experience.

The chapter on "Bones and Joints," by Sir John Lynn-Thomas, in which he deals with fractures and dislocations and their treatment, is one which no practitioner can afford not to read and study carefully, for it is full of first-hand information. The

section on "The Rectum," by Sir C. Gordon Watson, and on "Genito-urinary Operations," by Mr. Swinford Edwards, are admirable, and give in small space most useful advice and information on lesions and diseases, for which the aid of the practitioner is likely to be urgently needed.

The excellent chapter on "Gynæcology and Obstetrics," by Dr. Comyns Berkeley, warns the general practitioner of the dangers of the uterine curette and the obstetric forceps, which he says "are responsible for more misery to women and more deaths to children than any other."

The section on "Sports Injuries," by Mr. Frank Romer, will prove most useful to every medical man engaged in general practice, as it explains tersely, yet fully, the pathology and treatment of many ordinary affections.

A very lucid and learned description of "Antiseptics in Common Operations, and their Mode of Action," is given by Dr. W. E. Dixon, which will repay study. He says that "no antiseptic can be regarded as *the best;* each has its special use; many are irritant; most are much weakened by the presence of protein; some are toxic after absorption, and some have affinities for special organisms." Yet I think he seems to favour the chlorine derivatives, and especially chloramine T. in the treatment of infected wounds.

The last section, by Dr. Dudley Buxton, on "Anæsthetics," is excellent, and should be read by every practitioner, who may, of course, at any time have to give an anæsthetic.

Altogether, this Special Number forms an ideal means of assisting the general practitioner to fulfil his conscious responsibility to his practice, thereby continuing his good service to humanity.

Ophthalmic Operations.

By SIR ANDERSON CRITCHETT, Bart.,
K.C.V.O., M.A., F.R.C.S.E.
Surgeon-Oculist in Ordinary to H.M. the King; Consulting Ophthalmic Surgeon to St. Mary's Hospital, etc.

"THE *possibilities* of ophthalmic surgery are so terrible that we whisper them with bated breath." These words were spoken by my father more than forty years ago near the close of his successful career, and, although we have since then had the advantage of local anæsthetics, and of improved aseptic and antiseptic methods of treatment, they remain true to-day. He was using them in association with the work of skilled and experienced ophthalmic surgeons. When, therefore, I was invited to express my views in this Special Number of THE PRACTITIONER respecting the ophthalmic operations which might be performed legitimately by general practitioners, my father's grave note of warning recurred at once to my mind. I felt, and I still feel, that such an important matter should be dealt with by a jury of ophthalmic experts rather than by the *ipse dixit* of one individual, even though he can lay claim to the possession of long and wide experience. In any case the conveyance of decisions arrived at must be suggestive, not dogmatic, for there may be special circumstances which might lead one to alter, or at any rate to modify, one's judgement.

A general practitioner may have had the good fortune to be ophthalmic house-surgeon or senior clinical assistant at some large hospital where he will not only have had the advantage of seeing all the important eye operations skilfully performed, but may have done some of them himself aided by the counsel

and supervision of his teacher. Or a practitioner may have attended post-graduate courses in which there have been practical operative demonstrations. In these exceptional instances the responsibility must, I feel, rest with the individual, but, unless such special advantages have accrued, I am decidedly of opinion that general practitioners will be well advised not to undertake any operation on the eye of an intraocular character. These should be reserved for the ophthalmic surgeon, and it is only by long and, if I may use the expression, graduated experience that he becomes fitted for his responsible duties. Moreover, it cannot be denied that the qualities demanded of a successful operator are of a special kind. As soon as he has decided to adopt this branch of the profession he must, *inter alia*, set himself to acquire ambidexterity, and this can only be accomplished by constant practice spread over a considerable period. He must not regard his work from the standpoint of general surgery, for he has to train himself to deal with an organ which may be described roughly as a bag containing fluids of different densities, together with some of the most sensitive and delicate structures in the whole range of human anatomy.

There is an Eastern saying that the oculist should have the eyes of an eagle, the heart of a lion, and the hands of a woman. I have yet to meet with the individual who can claim all these qualifications; but I may mention incidentally that when I was ophthalmic surgeon at the Royal Free Hospital, where all the students were ladies, I found that, till they had been trained in the right method of touching a tender eye, the delicate feminine fingers showed no special advantage over the manipulations of the mere male. I am, however, bound in justice to record that several of my lady students developed into excellent operators, and some of those who went to India excited the

envy of their teacher by sending home glowing reports of the wealth of opportunity which they found for the exercise of their skill, especially in the matter of cataracts.

To return to my friends the general practitioners. Some of them may think that I am unduly cautious, and even severe, in warning them off from intraocular operations, but I would say to them as we do to children whom we love but feel bound to admonish, it is all for your good; and by way of offering some measure of compensation I will allude briefly to a few directions in which practitioners may exercise their manipulative skill in connection with eye troubles. (I presuppose absolute personal cleanliness, and the sterilizing of all instruments.)

To begin with, when they are consulted with reference to an *inflamed eye* I would beg them to make careful search for a foreign body, or for an ingrowing eyelash. Failure to do this may cause a more observant rival to score, and the patient to blaspheme. A powerful magnifying lens should be used, and every portion of the cornea be brought plainly into view by oblique illumination. If nothing is found there, the upper lid should be everted and the palpebral conjunctiva thoroughly examined. Occasionally, the source of irritation may be traced to a vagrant lash, which has found its way into the punctum. In order to evert the upper lid the assistance of the patient must be sought and given, for without it the most skilful manipulator may fail to achieve his object. The patient must look gently downwards, adopting the passive, not the active or the potential mood. The majority of ophthalmic surgeons have acquired a rapid knack of everting the upper lid by using the thumb and the forefinger of one hand simultaneously, but for the practitioner who has not learned this method I would advise the use of a glass rod or a

probe with which gentle pressure is made just above the margin of the cartilage with the right hand while the lashes are grasped by the forefinger and thumb of the left hand, and a rapid turning movement is easily effected. For lifting foreign bodies from the cornea a round-ended spud should be employed, and care must be taken to remove as little as possible of the corneal epithelium. Unless the patient is exceptionally insensitive, it is always well to apply cocaine, and if the cornea has been unavoidably abraded a drop of castor oil should be inserted between the lids. There is no operation which is rewarded by such instant and grateful recognition on the part of the patient as the *removal of foreign bodies from the eye*. If I were to depart from my invariable rule and make a contribution to the lay press, I could write an article on this subject which would, I venture to think, prove to be fully as interesting as many which appear in popular magazines, for, during my long professional career, I have come to the rescue of many suffering mortals under the most varied circumstances, some humorous, others almost romantic, and in more than one instance the little incident has been the starting point of a life-long friendship. I hope that some of my friends who are in general practice may have equally interesting experiences.

Another useful operation which they may place legitimately on their list is the *removal of tarsal cysts*. These troublesome little excrescences may sometimes in an early stage be made to disappear by the use of a mild mercurial ointment and massage; but when operative measures have become necessary a cyst in the upper lid should be dealt with by a crucial incision through the cartilage, and, after the contents have been evacuated with a small spoon-ended probe, or best of all with a Volkmann's spoon, the cyst wall must be thoroughly removed by firm scraping. In the lower lid it is sometimes more difficult to bring

the cyst well into view, but this can be accomplished with specially constructed ring forceps, or, if these are not ready to hand, a small straight lance-headed needle may be passed through the cyst after the lid has been everted, and then with a sharp Sichel's knife the conjunctiva may be incised on each side of and parallel with the needle. The upper part of the cyst may be cut out, and then the remainder be thoroughly dealt with as in the upper lid. The lid may continue swollen for a few days, and some amount of thickening may remain for a week or two, but complete absorption will ultimately take place. It may be well to explain this to the patient.

The practitioner may be called upon to deal with *defects in the lachrymal apparatus*, and these, though seldom serious, are often very troublesome, alike to the patient who suffers them and to the individual who endeavours to relieve them. If the trouble amounts to little more than occasional watering of the eyes in cold weather, the complainant may be reminded of Hamlet's hint that it is "better to bear the ills we have than fly to others that we know not of"; especially as the defect may in certain instances be remedied by the use of some mild astringent lotion or drops. When, however, the condition is more serious, especially if gentle pressure on the lachrymal sac brings some muco-purulent fluid up through the punctum, it may be necessary to adopt more decided measures. The canaliculus may be gently and gradually enlarged with Nettleship's dilator, and the sac syringed out once or twice a week with boric acid lotion; but the slitting of the canaliculus and passing of probes, always a debatable method of treatment, should, in my view, not be attempted by the general practitioner. If there is an abscess of the sac, it must be incised.

Hordeola (styes) usually effect their own cure, but the latter may sometimes be hastened by the removal

of an eyelash when the swelling is coming to a head. If an incision is made, it should be small, and be parallel to the edge of the lid.

There are other small but necessary operations, such as the *removal of small chalky concretions from the lids*, and if these make their way to the surface and irritate, or even scratch, the cornea, they must be dealt with, but I will go on to one operation (*enucleation*) which every practitioner should know how to perform—the knowledge *when* to resort to it is a more difficult and responsible matter. I will not deal with the details of the operation because they are given fully in every ophthalmic text-book; but I wish to call attention to a valuable discovery made by Sir William Lister during his responsible period at the War. He found that in all cases when there was a septic element the optic nerve should not be divided behind the globe but that a small rim or fringe of sclerotic should be left. By this simple proceeding the risk of meningitis and kindred troubles was lessened materially. An old glaucomatous eye with hard globe, thin conjunctiva, and attenuated muscles is an ideal one for enucleation from the operative standpoint, and the complete removal should be effected in a few minutes; but in cases in which the globe has been ruptured, or a wound has caused a considerable loss of vitreous, the operator must not hurry matters, for the division of the muscles under these circumstances needs patient and delicate manipulation. The removal of an eye must always be regarded as a serious and responsible proceeding—certainly the general public consider it to be so—and I would counsel the practitioner who contemplates this operation to use every endeavour to secure a second opinion before making his final decision.

Throat, Nose, and Ear.

By SIR JAMES DUNDAS-GRANT, K.B.E., M.A., M.D., F.R.C.S.
Consulting Surgeon to the Central London Throat and Ear Hospital; Hon. Consultant in Aural Diseases to the Ministry of Pensions, etc.

I AM asked in this paper to deal with operations which, from their nature, are well within the scope of the practitioner, or which, from their urgency, require him to undertake them when the co-operation of an expert is not available. In my selection of the cases which come into these categories, I shall be guided mainly by my observations and experience in general as well as in special practice.

Operations urgently required for the Saving of Life.—In connection with the throat, the most obvious danger is that of suffocation from obstruction of the larynx. It is usual to dwell upon the need for removing the cause, having considered all the possibilities, but in case of threatened asphyxia it is sometimes necessary to put the patient in safety, and *then* return to a consideration of the cause. Professor John Chiene stated the question quite bluntly as "Is the patient dying of asphyxia? If so, open the air-passage." We will, therefore, suppose a case of threatened death from asphyxia. If the danger is not quite obvious, what signs of danger shall we look for? Laryngeal stridor, which is inspiratory accompanied by violent "excursions"—downward drawing—of the larynx with each breath, insuction of the supra-clavicular spaces during inspiration, increasing cyanosis, and, in sum, a struggle for breath and life, which should be obvious at once, but which, alas! some of us are apt to realize only

after experiencing disappointment through delay in performing tracheotomy. The "pulsus paradoxus," diminution of the radial pulse during inspiration, is worth looking for if there is time, but not otherwise. If the suffocation has come on from the impaction of a lump of food during a meal, it *may* be justifiable to endeavour to dislodge this by means of the finger, but no time should be lost if the asphyxia is threatening.

The simplest operation for laryngeal obstruction is so-called "laryngotomy" or intercrico-thyroid laryngotomy. For this a vertical incision is made in the middle line over the thyroid and cricoid cartilages, the soft parts are retracted, and a sharp-pointed director is forced through the crico-thyroid membrane; a second one is pushed through alongside this, and an ordinary tracheal dilator, preferably Butlin's perforating one, is introduced between them. A flattened tracheal canula or short flat tracheotomy tube is then introduced, and the tapes attached to its collar are tied round the neck. This is the laryngotomy perfected by the late Sir Henry Butlin, which we have gratefully employed as a preliminary to operations on the nose or naso-pharynx in which plugging of the pharynx is required. This counsel of perfection is only to be acted on when the danger of asphyxia is not too pressing. The operation has more often to be carried out by pinching up the skin, transfixing it with a sharp-pointed bistoury and cutting outwards, then stabbing through the crico-thyroid membrane horizontally, close above the cricoid ring, and introducing a tube on a pilot. In the absence of the standard tube, the lips of the opening may be kept open by means of two hairpins bent so as to form retractors, a large quill, a catheter or a piece of drainage tube, until the crisis is over. This operation must be recognized as only a temporary expedient. The sooner the tube is removed the

better, and if there is still evidence of laryngeal obstruction, a leisurely and bloodless tracheotomy must be performed, well below the cricoid cartilage.

Again it must be remembered that intercrico-thyroid laryngotomy is inadmissible in the young child. For them some operators have intentionally cut through the cricoid cartilage and the one or two upper rings of the trachea (crico-tracheotomy) and many more have done so thinking they were only dividing the rings of the trachea. These efforts have been followed by prolonged disturbance of voice or by stenosis of the larynx rendering removal of the canula for the time, or for all time, impossible. There has been, however, the consolation that the child's life has been saved though at the expense of some distressing sequelæ which may be susceptible of correction by timely expert intervention. In an emergency, the saving of life must be the first consideration.

The operation of choice in the child is that of *high tracheotomy.* When the symptoms are urgent, the operation should be carried out at once as follows :—

The surgeon stands on the right side of the patient. He fixes the larynx by means of the thumb and middle finger of the left hand, localizes the lower margin of the cricoid cartilage with the tip of the index finger. He then makes an incision in the median line downwards from this index finger of at least an inch in length, cuts up and down through the cellular tissue and aponeurosis. He now introduces the index finger into the wound and with it pulls the cricoid upwards, punctures the trachea boldly with the point of the bistoury, the back touching the finger nail, and when the air enters the puncture with a whistling noise and some blood is coughed out, he divides the trachea from above downwards through two or three rings, the finger following the blade downwards. The canula

is now introduced either directly by means of the pilot-guide or after the introduction of the trachea dilator.

If there is time for *deliberate tracheotomy*, it should be carried out in the recognized way. It is well that the operator and assistant should each have a pair of ordinary dissecting forceps. The operator pinches up a layer of fascia to one side of the middle line while his assistant does the same immediately opposite him, and he then cuts through the raised layer in such a way as to avoid dividing any veins which lie across his incision. This is repeated again and again as required. Veins may be seized by two artery forceps and cut between them. The thyroid gland may be cut through in the middle line without hesitation. It may, however, be loosened above by horizontal division of the firm fascia, by which it is attached to the cricoid cartilage, and then drawn downwards to expose the two uppermost rings of the trachea. For additional security, it may be seized by two long-bladed artery forceps from above downwards and divided between them. A sharp hook may be passed under the cricoid cartilage for the purpose of drawing it up and fixing it while the trachea is incised.

It must be remembered that, in the child, it is possible to cut through into the posterior wall of the trachea. If this accident occurs, the canula is apt to pass through the slit and stop the breathing, which returns when the canula is taken out. When contemplating opening the trachea on account of threatened asphyxia as indicated by stridor, it is well to keep before the mind the question whether the stridor arises from obstruction in the larynx, the trachea, or the bronchi, for it must be obvious that the prospect of relief from tracheotomy depends greatly upon whether the obstruction is in the larynx or lower down. The stridor produced by obstruction in the larynx is inspiratory, is accompanied by downward

"excursions" of the larynx during inspiration, and is most relieved by the throwing of the head backwards. Think of "croup." Bronchial stridor is expiratory, because the movement of expiration produces compression of all the organs in the thorax including the bronchial tubes. Think of asthma.

Tracheal stridor from compression or narrowing of the trachea is both inspiratory and expiratory; it is not usually accompanied by "excursions," and it is most relieved by bending the head forwards to diminish the narrowing which lengthening of the trachea would produce; comparable to the tightening of the plaited straw tube of the nursery trick, when with a finger in each end the more we pull the tighter it gets. The stridor is quiet, "hollow" in tone, and accompanies both inspiration and expiration. It is most often produced by compressive bronchocele or aneurysm of the aorta, and the practitioner who is not familiar with it would do well to look out for such cases and note the characters of tracheal stridor. It may "from many an error free" him.

The following are points worth remembering in regard to tracheotomy:—

To make certain of having the best possible light (Parker, Jacobson). A forehead lamp does well as long as it does not get obscured by expectorated blood. To realize the great tendency to work towards the left side of the trachea (unequal action of retractors, direction of vision, etc.). To remember that the trachea runs obliquely downwards and backwards, and to choose, therefore, as a rule, an obtuse-angled tube instead of a right-angled one. Parker's angle is the most suitable. The edge of a right-angled or quarter-circle tube is apt to plough up the mucous membrane of the anterior wall of the trachea.

The life of the new-born child may be in jeopardy from failure to breathe; when other methods of

exciting respiration have appeared to be unavailing, the passage of a gum-elastic catheter into the larynx and trachea, and the blowing of freshly-inspired air from one's own lungs through it has at once started spontaneous respiration. The point in introducing it, under the guidance of the left forefinger, is to feel for the arytenoid eminences which are very easily perceptible, and not for the epiglottis which is extraordinarily elusive. The practitioner should accustom himself to feel them when introducing a finger into a new-born baby's mouth for any purpose.

The infant may be threatened with suffocation from two sources, each giving rise to a special form of stridor, the one nasal the other laryngeal.

Congenital post-nasal adenoids, or occlusion of the choanæ, give rise to a snoring stridor, which sounds quite alarming, and an inability to breathe with the mouth shut, which prevents sucking the bottle or the breast, having to throw back its head when trying to do so in order to get breath, in a most pitiable fashion. Spoon-feeding is then the somewhat poor resource. The naso-pharynx is too small to admit of palpation by the smallest finger, and the only way to diagnose and at the same time diminish the bulk of the adenoids is to introduce an extremely small adenoid forceps so as to pull away sufficient of the growth to give relief. The condition is, however, quite rare.

Congenital occlusion of the choanæ is so rare as to be almost a curiosity, but when present it is a serious calamity. Fortunately it is usually unilateral. A probe or director passed through the nose from the front meets the obstruction, and may perhaps force its way through it. If not, it is safer left alone by any except the expert.

Laryngeal stridor in the new-born is due to such laxity of the walls of the upper part of the larynx that they are drawn in with an inspiration which is at all

forcible, and act as a valve to prevent the entrance of air. Fortunately, quiet respiration can be carried on, and very rapidly; as the larynx enlarges in width, the indrawn walls do not close the passage and cease to be indrawn. In most cases, if the child can be kept comfortable and quiet, it can be tided over the time of danger. Tracheotomy is practically never called for in this condition. The diseases of the pharynx, which endanger life and in which the intervention of the practitioner is of the most urgent importance, are retro-pharyngeal abscess and peritonsillitis.

A retro-pharyngeal abscess bulges into the back of the pharynx so as to interfere with respiration and deglutition, but the danger attaching to it is that of spontaneous rupture and the entrance of pus into the trachea, especially if the rupture occurs during sleep. In the adult, an incision is made into the swelling with the patient sitting up. A curved sharp-pointed bistoury, with the nearer part of the blade wrapped in cotton-wool, may be used. The patient bends forward and hawks the pus out into a basin. A little iodoform emulsion in glycerine may then be injected by means of an ordinary glass syringe. An infant should be wrapped in a blanket, laid on its back with the head hanging down so that light may fall into the back of the throat. The tongue must be held up by means of a spatula. The incision is made into the centre or the most bulging part of the swelling, and the patient is then quickly turned over on its front with the head dependent so that the pus may run out of the mouth and not into the larynx.

As a rule, the abscess is in the adult the result of exposure to cold while in a depressed state of health, and is a circumscribed condition so far as the operative intervention is concerned, though antistreptococcic serum may be advisable. In the young child, it is usually due to the breaking down of a gland in the

retro-pharyngeal tissues and so far quite circumscribed. In all cases, however, it is well to assure one's self that it is not connected with tuberculous disease of the spine. In this case there would probably be other evidence of the condition. To eliminate such an unusual possibility it is advisable to examine the back of the neck with one's fingers, and to press the head down with one's hand on the vertex to ascertain that this does not produce pain. It is to be noted that the abscess of itself causes the child to hold its head in a fixed position, which is characteristic, quite apart from spinal disease. This simple method of treatment is most successful and should be adopted by the practitioner, in spite of the theoretically more ideal method of operating from the side of the neck, after which a counter-opening in the pharynx may still be called for.

Peritonsillar abscess or *quinsy* is generally speaking a collection of pus, not in the tonsil, but in the tonsil's "bed." The incision for its evacuation must, therefore, not be made into the tonsil but into the bulging to the outer side and slightly above it. The point for puncturing is at the centre of a line running from the base of the uvula to the last upper molar and the cut (made with a curved sharp-pointed bistoury) should run downwards and slightly outwards. Theoretically, the pus should be made accessible by the introduction of a curved forceps through the supra-tonsillar fossa. This is only easy in the hands of an expert, and he will probably, as a rule, fall back on the incision above described. Occasionally, the abscess is behind the tonsil, and its presence may only be revealed when on the failure of the ordinary incision a careful inspection is made with a good forehead light, which, in any case, is rendered difficult by the characteristic closure of the jaws. The incision should then be made from before, directly backwards into

the swelling behind the posterior faucial pillar. Although recovery from peritonsillar abscess is the rule, even if the abscess is left to open itself, deaths have resulted, and, therefore, the operation may be said to be life-saving. The difficulty in opening the mouth is usually an indication that the abscess is "ripe" for incision.

The thickness in speech accompanying quinsy is well-known, and when it is present one expects, on opening the mouth, to find the evidence of it. If, however, that "thickness" is present and no quinsy is found, there is probably a focus of inflammation lower down in the pharynx, which is associated with very dangerous blood-poisoning. This form of septic pharyngitis is apt to extend to the larynx, and produce such obstruction as to threaten asphyxia and call for tracheotomy. Unfortunately, by the time the disease has reached this extent, tracheotomy is unlikely to avert death from septic intoxication. The best local treatment is the administration of small pieces of ice, and such serum (antistreptococcal) and other treatment (dermatoclysis, etc.) as will favour the dilution and elimination of the toxins, and maintain the patient's vital resistance. Though this may seem a digression, I make no apology for it in the light of practical experience.

Epistaxis almost invariably arises from rupture of small vessels on the lower and anterior part of the septum, within easy reach of the eye and of the probe. These can usually be occluded by means of the application of a finely pointed stick of nitrate of silver to the largest of the ramifying vessels. A plug of gauze or of non-absorbent cotton pushed a short way into the nostril with the ala nasi pressed against it will often suffice. It must be remembered that epistaxis is often a manifestation of high arterial tension, and a relief rather than a danger. Too great zeal should

not be exercised to stop the hæmorrhage in such cases.

If plugging the posterior nares is insisted on, it is to be remembered that the plug of gauze should be small, that it should be lubricated on the surface (not soaked) with vaseline, and that it should be removed in twenty-four hours at the most. The usual method of introducing it is to pass a No. 6, soft, indiarubber catheter through the nasal passage till it shows itself in the back of the throat, when it can be caught with forceps and pulled out through the mouth without its other extremity getting lost to sight in the nose. A silk—or other—cord of two feet in length having the plug secured at its middle is tied by one end to the catheter, which is then drawn up through the naso-pharynx bringing the end of the cord with it. This is pulled through the nose till the plug reaches the back of the throat. The plug is very gently guided behind the soft palate and drawn up into the posterior choana. The further steps are obvious. Belloc's sound acts extremely well, but the catheter causes less discomfort. Inflatable balloons of various forms may be introduced and blown up, but in my experience they are seldom applicable. They are useful, however, to leave in the hands of patients to give them a sense of security.

Of all the operations which by timely performance give immunity from serious disability and danger, there is probably none more important than *paracentesis of the tympanic membrane* for acute suppurative inflammation in the middle ear. The practitioner should, therefore, be prepared to carry it out without delay. The indications are generally obvious. Extreme pain, feverishness, and deafness (not to be accounted for by a swelling in the meatus such as a furuncle) of such severity as to prevent sleep for one or two nights, call for puncture or incision of the membrane. If there is tenderness on pressure in the mastoid region,

the call is all the more urgent, but this tenderness during the first week does not call for mastoid operation, though at a later period in the disease it may do so. The appearance of the tympanic membrane is usually that of a puffy red swelling, the malleus and other distinctive features being lost and merged in the general congestion and tumefaction. If the lie of the membrane can be identified, the postero-inferior quadrant is opened by a curved slit made with a fine sharp myringotome —or a tenotome or Graefe cataract knife—entering below and cutting upwards or by preference, if possible, curving backwards and upwards parallel to the posterior wall of the meatus. The knife cuts from below upwards to avoid a prominent jugular bulb, and to get deeper as it goes on, for the tympanic membrane slopes from above downwards and inwards. The antero-inferior fibres act as an opponent to the inward traction exercised by the tensor tympani muscle, and on that account should be preserved.

All should be done under the guidance of the eye with well-directed light, but in actual practice it may often be necessary to trust to groping along the floor and back-wall of the meatus and pushing the point of the knife through the membrane till it touches the inner wall of the tympanum. The most likely error is that of striking the posterior wall of the meatus and coming to a dead-stop. The point of the knife should then be disengaged and directed more anteriorly, and then again pushed through the membrane with every probability of success. Though the accuracy of the specialist may not be attempted there are certain precautions, which go far to minimize the risks of disaster, which are within the range of every practitioner, especially the preliminary sterilization of the parts. This has probably been effected to a considerable degree by the antiseptic drops usually employed in the treatment of the disease,

such as:—Glycerine of carbolic acid 1 part, with 3 parts of pure glycerine, or, in the presence of much pain, morphia hydrochlor. 1 part, cocaine hydrochlor. 2 parts, phenol 3 parts, glycerine to 60 parts; but before operation the auricle should be washed and then scrubbed with biniodide and spirit. This should also be painted well into the walls of the meatus short of the deepest part of that passage.

The knife may be dipped in spirit, which is then ignited at the flame of the spirit lamp. After the incision, the meatus should be gently swabbed with a twist of sterilized absorbent cotton-wool or gauze after the patient, if awake, has "blown through" the ear. A general anæsthetic is desirable, and nitrous oxide gas usually suffices, but much may be done with a local one and a fine pledget of cotton-wool, preferably non-absorbent (it will be noted how crowded specialism is with minutiæ), is pushed down to the membrane and left in contact with it for four or five minutes, with its tip moistened with Bonain's solution, namely, equal parts of menthol, phenol, and cocaine hydrochlor., with, if desired, a trace of adrenalin. The touched spot will be whitened and anæsthetic.

The "Mastoid" Operation. — There are mastoid operations and mastoid operations; some are of extreme difficulty, others comparatively easy. Fortunately, the difficult ones, such as the radical operation for chronic disease of the middle ear and petrous bone, generally admit of consultation, or, at all events, deliberation. On the other hand, those the practitioner may have to deal with on the spot are the acute suppurations extending from the middle ear to the "mastoid cells," and usually resulting from acute catarrh, influenza, or the exanthemata. In these, especially the influenzal forms, the suppurating cells are generally large and superficial, such an anatomical conformation appearing the most readily

to invite pyogenic invasion. Even if the practitioner deals with such cases only, he may prevent much disease and save some lives; any defects in the operation may be rectified later if necessary. It has already been laid down as a general rule that tenderness on deep pressure on the mastoid during the first week arises from congestion of the vascular tissues in the cells, which usually passes off, and is not, as such, an indication for opening the cells. When it persists or supervenes at a later period, it depends upon extension to the periosteum and bone with suppuration and, as such, calls for evacuation of the pus or, at least, drainage and relief of tension by mastoid operation. This indication would be reinforced by the presence of baggy swelling in the tissues covering the mastoid.

We are, for the moment, assuming that there have been definite signs of suppuration in the middle ear, and that we are not dealing with the mastoid pain, tenderness, and swelling which often accompany a furunele on the posterior wall of the meatus. In this we have the swelling inside the meatus, and a peculiar form of swelling in the mastoid region. The inflammation extends from before backwards and, therefore, obliterates the fold at the attachment of the auricle; at the same time, it projects this outwards from the side of the head. I have had cases of this kind referred to me with a view to a mastoid operation, and have relieved the condition at once by a deep incision directed backwards into the furuncle. In the absence of "mastoid signs," the persistence of a purulent discharge for two or three weeks affords justification for opening the mastoid cells. The simple "cortical" mastoid operation is one which the practitioner should be ready to carry out if accustomed—as he ought to be—to observe the principles of ordinary aseptic surgery. This cortical operation consists essentially in opening the bone in the mastoid immediately

behind the bony external meatus to an extent of about the same size as the meatus. He may hopefully expect to open thus into a large cell because, as has been said, the extension described takes place, as a rule, in large-celled (pneumatic) mastoids.

The auricle being drawn forward with the left hand, an incision just through the skin is made, about half-an-inch behind the attachment of the auricle and parallel to it, from the level of the highest point of the attachment down to the very tip of the mastoid process. The incision is then carried through the soft parts down to the bone, hæmorrhage being checked to a reasonable extent. With an elevator the periosteum is now raised and pushed forward and backward. The posterior margin of the osseous meatus must be well exposed and identified as a landmark. Retractors or a self-retaining pair of retractors should now be introduced so as to keep the area of operation on the bone quite clear. A gouge (such as Heath's) and mallet are then used so as to chip away a superficial layer of bone behind the meatus of about the area of this opening. This is cautiously repeated until the cortex is opened sufficiently to allow of the exit of pus or the introduction of a bent probe (Dundas-Grant's). With this he can take his bearings and chisel or cut away (with bone punch-forceps) the overlying bone. The probe will often lead him down to the interior of the tip of the mastoid process into a cell containing pus. It may also lead him up to the mastoid antrum and if so, he should chisel away the bone over this, thus making a counter-opening so as to allow of drainage of that cavity.

Although the expert would make use of opening the antrum, the non-expert might be wise to stay his hand at this stage, having probably done his best and having certainly done well. Granulations bathed in pus may be *very gently* scraped away with a rather blunt spoon and the interior of the cavity swabbed

with ten volume peroxide of hydrogen. A strip of gauze, moistened with a glycerine emulsion of iodoform, may now be introduced, and a dry sterile dressing placed over all. Before the dressing the tympanic membrane should be incised. The wound may be partly closed by means of silk-worm gut stitches (or Michel's clamps), leaving open the part through which the plug can be most easily removed or introduced. In case of pain a moist dressing of boric acid or acetate of alumina (liq. aluminis acetatis one part to seven of hot water) may be applied. Next day the plug should be removed, and replaced by an indiarubber drainage-tube. This is shortened daily, and in a few days can generally be removed.

In operations on the mastoid there are two points to be kept in mind, the position of the lateral sinus and that of the facial nerve at different ages. These are pictured in Ballance's work on the *Surgery of the Temporal Bone* (Pl. XV. and CX.). In the infant and young child, the tip of the mastoid process is so undeveloped that the facial nerve lies on the outer surface of the bone instead of being buried in, and issuing on, the under and inner surface.[1] Therefore, when cutting down on the "mastoid" in these young subjects, the facial nerve must be protected by the tip of the operator's left index finger placed behind the lowest part of the attachment of the auricle on the part of the bone where the "mastoid process" ultimately develops. This relation is so important that I have thought it right to insist on it with what may appear to be exaggerated emphasis. At this immature age the antrum is higher in relation to the meatus than it is in the adult. The lateral sinus also is further back.[2]

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Some Surgical Emergencies, with special reference to the Abdominal Region.

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A SURGICAL emergency arises when instant action has to be taken to save life, limb, or the function of a part. The more skilled the surgeon is in diagnosis and the more he can foresee the end, the fewer will be the emergencies he meets, for he will understand what has happened or is likely to happen, and will have taken the necessary steps to deal with it. But emergencies occur in every man's practice, and I propose to deal with some of them in the present article.

Cut Wrist is one of the commoner accidents met with in general practice, and is one of the most likely to be followed by disastrous results unless care is taken to suture tendon to tendon and nerve to nerve. Too often a cut tendon is joined to a divided nerve, or the tendons are united and the nerves are neglected. There is no difficulty in recognizing the greyish-white, linearly striated trunk of the ulnar or median nerve from the dead-white and retracted tendons. A tourniquet should be applied to the arm, the wound enlarged, the divided ends demonstrated and sutured methodically like to like.

Thecal Abscess, in the course of a poisoned wound of the finger, often becomes a surgical emergency from the rapidity with which it extends in unhealthy

persons. If the patient can bend his finger in a case of whitlow, the abscess is outside the sheath of the flexor tendon; if movement is impossible on account of the pain, the abscess is inside the sheath. The treatment consists in making numerous and early incisions in the middle line along the phalanges, avoiding the neighbourhood of the interphalangeal joints. In the palm, the incisions should be made along the metacarpal bones distal to the superficial palmar arch, which is situated beneath a line drawn transversely across the palm from the web of the outstretched thumb. Immediately above the wrist incise on either side of the palmaris longus tendon. I have never regretted making too many incisions in these troublesome cases, but I have often had considerable difficulty in getting house surgeons to make them long enough, for what appears to be a very long cut in a greatly swollen and inflamed finger shrinks till it becomes quite a small one when the inflammation has subsided.

Retropharyngeal Abscess, occurring in babies, is often overlooked until it has attained a very considerable size and the child is in danger of suffocation. I prefer to open it externally by making a 1-inch incision, beginning an inch below the mastoid process and immediately behind the posterior border of the sterno-mastoid. The knife is laid aside as soon as the deep fascia has been divided, and the abscess is opened with a blunt-pointed director, one finger being kept in the mouth, touching the back wall of the pharynx. The abscess is readily emptied by pressure exercised through the pharynx, but care must be taken to empty also any pouches which may extend downwards, for a retro-pharyngeal abscess is sometimes loculated like a psoas abscess.

Secondary Hæmorrhage is often a grave surgical emergency. It only occurs in septic wounds. It

comes on without warning, and time is wasted in palliative treatment in the hope that it will not recur.

The earliest record of an action for surgical malpraxis was in just such a case. A man cut his thumb in January, 1424, and was attended by a barber and a general practitioner, who stopped the bleeding seven times. When it recurred the eighth time they called in a surgeon, who finally arrested it. The plaintiff brought an action for damage to his thumb, but was non-suited when the surgeon proved that he had given his consent after it had been explained to him that his thumb would not be as useful as before.

By all means try such palliative treatment as the application of a lotion at a temperature of 125° F., which is sufficient to coagulate the globulins. Afterwards apply a pad and bandage firmly and elevate the limb. If the bleeding recurs, and it is from a large vessel, do not wait until the patient is reduced to the last extremity, but ligature the main artery and do not attempt to tie the bleeding point on the face of a septic stump.

Depressed fracture of the skull is a surgical emergency of great importance when it results from some of the less recognized forms of injury, such as a blow from a cricket or golf ball, or in the course of a hockey match. In such cases the patient may present few, if any, symptoms; he chivalrously makes light of the injury, a hæmatoma forms quickly, and a correct diagnosis is difficult. Where it is not possible to obtain a radiograph, less harm is done by exploring the bone than by waiting for symptoms to appear.

In like manner a *broken nose* is a surgical emergency, because the nasal bones unite so quickly when they are broken that replacement should be done at once with dressing or nasal forceps, the shape of the nose being maintained by intranasal splints.

Acute retention of urine is always a surgical emergency. Two mistakes are commonly made when the retention is due to an enlarged prostate; either too

small a catheter is used, or too short a one is passed. The urethra in these cases will always admit a full-sized catheter, which can be passed quite easily if it is well depressed between the thighs as soon as it reaches the prostatic urethra. The use of a small catheter makes the operation much more difficult, and it is more likely to cause a false passage. The catheter should be passed in boldly until urine flows. The mistake more often made is that the practitioner does not pass it far enough, apparently because he fears that the urethra will take charge, gulp down the instrument and pass it on into the bladder, which is absurd. I prefer a silver catheter in this form of retention, though there are some useful silk catheters now made with flexible ends, which adapt themselves well to the sinuous prostatic urethra.

Acute retention due to stricture is much more difficult to treat, and in the spasmodic forms half the battle consists in gaining the confidence of the patient, so that he will allow the catheter to be passed on steadily and uninterruptedly. I still believe in a hot bath and the administration of 20 minims of tinct. opii before speaking of the necessity of catheterization. Suprapubic puncture must be done when it is impossible to pass a catheter, care being taken to use a fine and long needle, for if an ordinary trocar and canula be employed there is some danger of the bladder contracting away from the canula as it empties itself, and thus allowing of extravasation of urine into the pelvic tissues. In impermeable strictures, Wheelhouse's operation of external urethrotomy should be performed as soon as possible after temporary relief has been given.

Traumatic rupture of the urethra is a very serious accident, and an attempt should be made to pass a catheter into the bladder as soon as possible, because the least unsatisfactory results are obtained when

this is done before the patient has attempted to pass water, and the urethra is often not completely torn through. External urethrotomy may have to be performed early, but there is usually so much bruising that the urethra does not repair itself satisfactorily.

Extravasation of urine needs early and free incision. The same rule holds good here as in thecal abscess, that the incisions should be free enough, because as the swelling subsides the incisions shorten. It is quite unnecessary to put in a catheter, for the urine drains away through the ulcerated urethra.

Strangulated hernia is always an emergency of the first order. Inguinal and femoral herniæ are now usually recognized at an early period. Since the introduction of anæsthetics the patients rarely refuse operation, and the results are therefore much more satisfactory than they used to be. The operation is comparatively recent, for Hey states that when he went to Leeds in 1759 he was the first surgeon to undertake it in that neighbourhood. The really difficult cases are those in which, from a variety of causes, neither a general nor a local anæsthetic can be given. Experience has shown that in such cases the simple relief of strangulation can be done rapidly and without undue pain in a fully conscious patient.

Strangulated umbilical hernia is not in the same fortunate position. It generally begins gradually and runs a more chronic course, usually in fat women who are accustomed to be constipated. The patients are usually seen much later than in other forms of strangulation. They require a more severe operation, and there is a high mortality.

The really serious emergencies are those which occur in connection with "*the acute abdomen.*" The sooner the condition is recognized and an operation for its relief is undertaken, the more likely is the patient to survive. The diagnosis should

be made as soon as possible after the onset of symptoms, and an operation must be done as soon as the diagnosis is made. The signs and symptoms change so rapidly in the most acute conditions, often with an apparent but fallacious improvement, that the earlier the patient is seen the easier is it to make a diagnosis.

This is especially the case in *Traumatic rupture of the bowel.* A patient is run over or squeezed between the buffers of railway trucks. He is picked up in a state of collapse, and superficial examination shows no external injury, except perhaps slight bruising of the abdomen or a little local tenderness. He is said to be suffering from the shock of the accident, is put to bed, and is treated *secundum artem.* The collapse passes off, and the patient may even sleep quietly and have an evacuation of the bowels. Usually he is left alone, and the surgeon does not note that his pulse is quicker than it should be, and that in spite of the statement that he is "all right," there is increased abdominal tension. Within 48 hours the signs of peritonitis appear, a hurried operation is undertaken, and the surgeon is surprised to find that the bowel has been torn across either completely or partly. He would have been saved from the disaster had he remembered that rupture of the bowel is associated with temporary cessation of its peristaltic movements. Some fortunate men in the war owed their lives to this provision of Nature. They lay untended, and even after several gunshot wounds of the bowel they recovered. The proper treatment is immediate operation, where there are reasonable grounds for supposing that the bowel has been torn.

Acute duodenal perforation is also likely to be overlooked for a time when it occurs in its most acute form, because the collapse soon passes off and the

patient appears to be improving. The condition is not difficult to recognize by anyone who has had a case under his care. The sudden onset in a man who has considered himself to be in perfectly good health, the absence of any history of severe indigestion, the great pain, the intense shock, and the general aspect of the patient, should afford evidence even before the abdomen becomes rigid. The shock, indeed, soon passes off, but as it does so the rigidity of the abdomen becomes a definite feature, together with the pain referred to the right iliac fossa, and the local tenderness above and to the right of the umbilicus. Immediate operation affords the only chance of recovery.

Acute gastric perforation also occurs suddenly in women as well as in men, but the onset is less unexpected than in perforation of the duodenum, as there is a history of previous indigestion or of treatment for a gastric ulcer. The pain, too, is more diffused, and there is not the same amelioration of symptoms when the shock of the perforation has passed off, as occurs in acute duodenal perforation. This seems to be due to the fact that the acid gastric juice is more irritating to the peritoneum than the alkaline secretion of Brünner's glands. Immediate operation is again the sole chance of recovery.

The First and Last Kink.

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THE operation on the condition which I describe as "the first and last kink" is one which perhaps may not be so commonly performed as are most of the other operations described in this Special Number of The Practitioner. Nevertheless, when the general practitioner has acquired enough skill and experience to feel sufficiently confident to perform any operation on the interior of the abdomen, the one I now describe is certainly one of those with the details of which he should be perfectly familiar. The first and last kink is by far the most important of all the acquired or evolutionary bands developing in the abdomen in consequence of the abnormal accumulation, and the delay in the passage, of the intestinal contents. It is essentially a product of civilization, and is responsible for very many of the troubles which constitute the price we pay for the advantages it affords to the community.

Delay of the contents of the large bowel produces a great variety of results, the variation depending very largely on the vitality of the individual. In one extreme, when the subject is feeble and more frequently a female than a male, the colon simply elongates and dilates from below upwards, Nature making no attempt to prevent these changes, the causes of which are obviously simply mechanical. In consequence of this elongation and distension of the colon, the several portions of the large intestine drop and produce a condition to which the term viscero-

ptosis has been generally applied. This dropping does little harm except in the case of the cæcum, in which, when prolapsed and dilated, Jordan has shown, by means of radiograms taken at various angles, torsion and obstruction of the terminal ileum may ensue.

The elongation and dilatation of the pelvic colon affords, however, a most serious obstacle to the passage of fæcal matter through it, since the loose elongated dilated loop of bowel puddles in the floor of the pelvis, and renders the transit of solid material through it very difficult and sometimes almost impossible. It is to meet this condition that intestinal lavage, commonly described as Plombière treatment is adopted, since it is the only possible means by which solid matter can be evacuated in advanced cases. This type is illustrated in Fig. 1, which is a diagram made from a series of cases of the same class by Dr. Jordan, and shows the radiographic appearances of extreme chronic intestinal stasis as it occurs in a feeble subject. It was taken while the patient was in a recumbent posture in order to avoid the prolapse of the elongated and dilated viscera. It is sufficiently explanatory to call for no detailed description. In the more vigorous subject the same mechanical factor, namely, constipation, is met in quite a different manner, since the tissues of the individual react vigorously. At every point of stress acquired membranes are formed in the mesentery, tending to retain the bowel in position in its normal relationship to the abdominal wall and to prevent its elongation, dilatation, and prolapse.

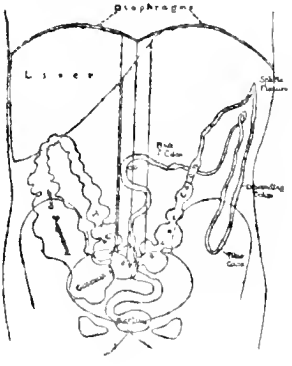

Fig. 1.

In describing the changes which the skeleton of the labourer undergoes in consequence of occupation,

I demonstrated that any alteration or variation which developed to enable the individual to accommodate himself more readily to his surrounding, or, in other words, to perform his laborious duties as economically as possible, tended to diminish his vitality and to shorten his life. The development of the acquired peritoneal bands, which are at first helpful, is no exception to this rule, while the results are even more disastrous than in the case of the labourer. As they become stronger and as they fix the bowel more and more firmly to the abdominal wall, so they reduce the lumen of the intestine at their points of attachment and so obstruct the passage of material through them. The constant impact of fæcal matter, as it is forced through the constricted bowel, produces in the first instance inflammatory changes which later readily take on a malignant character.

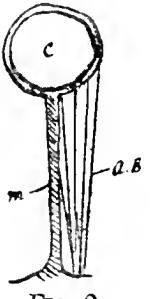

FIG. 2.

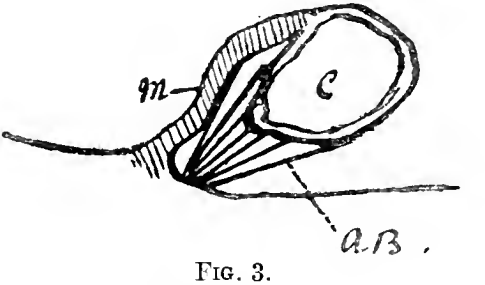

FIG. 3.

I have endeavoured to indicate in Figs. 2 and 3 the mechanics and the mode of development of the bands which form the kink. In both *C* represents the large bowel in transverse section, *M* the mesentery, and *AB* the acquired bands which extend along the under surface of the mesentery till they reach and secure the bowel.

In Fig. 3, the later consequences of the contraction of the acquired band are shown. The mesentery is shortened, while the bowel is fixed and its lumen

constricted and distorted.

In no part of the intestine is this change so pronounced as in the first and last kink, which may be regarded as the prime factor in the causation of disease in the several portions of the gastro-intestinal tract, the associated auto-intoxication causing all the tissues of the body to undergo degenerative change. Unfortunately, as time goes on, these bands control the effluent at their points of attachment and produce obstruction. The kink affects the large bowel as it passes over the brim of the pelvis, at the junction of the iliac and pelvic colon. It is in consequence of the obstruction, which is produced by the fixation of the large bowel at this point, that the difficulty in evacuating the proximal bowel results in the formation of similar bands along its convexity and at the end of the ileum, together with the changes in the small intestine, duodenum, and stomach, consequent on their obstruction. This is shown clearly in Fig. 4, in which the arrows show the direction of the lines of resistance.

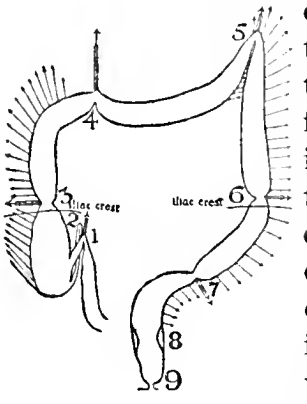

FIG. 4.

(1) Indicates the ileal kink. (2) The appendix passing up behind the ileum and controlling its lumen in the erect position. (3) The strong band which obstructs the lumen of this portion of the colon. (4) The band which extends down from the liver, gall-bladder, pylorus, and duodenum. (5) The splenic flexure whose angularity is accentuated and whose lumen is correspondingly diminished. (6) The deformity of the descending colon by a band similar to (3). (7) The first and last kink, the most important and the cause of the development of the preceding structure. (8) The circular band of muscle described

by W. J. Mayo. (9) The internal sphincter.

It is obvious that between the extreme types which I have described and which are shown in Figs. 1 and 4 very many modifications and combinations must exist, the variations depending chiefly on the degree of vitality of the individual.

It is the second type, namely, that illustrated by Fig. 4, that lends itself most readily to surgical interference, since by freeing the colon in the situation of the first and last kink, all the consequences of the obstruction, which existed there, are relieved at once and to a degree varying inversely with the stage of their development. In any case it is obvious that whatever has to be done to the changes in the gastro-intestinal tract, which have developed in consequence of the obstruction at the first and last kink, this, which is the cause of all the other troubles, should be dealt with efficiently at the same time.

One point of great importance in the development of the membrane which produces this kink is, that the acquired band or bands which produce it very frequently grip the left ovary and Fallopian tube, and may later surround the ovary in a complete sheath; this not only interferes with the functions of these structures, but it also produces cystic changes in the ovary. As the ovary is fastened very intimately and immovably to the bowel where it is anchored, obstructed, and inflamed, it is obvious that all the symptoms which are produced, both intestinal and ovarian, are exaggerated about the menstrual periods, and that the woman experiences great local ovarian pain as well as intestinal discomfort in this situation and in the proximal bowel, especially when constipated. The left spermatic vein frequently becomes involved in the cicatrizing band causing varicocele.

In Fig. 5 is shown the condition of the bowel

behind the obstruction in the fat subject, hernial diverticula of the mucous membrane producing a condition commonly called diverticulitis.

Clinically, the presence of the kink is readily recognized. Pressure on the iliac fossa above or below the anchored bowel is quite painless, but the moment it is exerted on the fixed and inflamed area of bowel the patient suffers great pain, which varies with the amount of pressure exerted and the degree of inflammation of the colon at the seat of constriction.

Fig. 5.

Ovarian pain is also readily elicited both by pressure on the abdomen over the fixed ovary or by bimanual examination.

The iliac colon can usually be readily felt by the finger, and the seat of obstruction can be clearly defined. If there is much flatulence, or if the abdominal structures are loaded with fat, a free purge renders the examination more easy and certain. A bismuth meal followed by a bismuth enema will afford naked eye evidence of the condition, if the examination is made by a radiologist who is expert at this work. I have known radiological reports do more harm than good from want of experience on the part of the operator. In my experience, good screen work is very rarely met with; radiograms alone are frequently misleading.

If the surgeon has rendered himself thoroughly familiar with the details of the structure and arrangement of the acquired bands, which anchor and obstruct the bowel at this point and which may also secure the ovary, the measures to be adopted are perfectly simple. That this knowledge is not general is shown by the casual way surgeons talk about "mobilizing the colon." In doing this they tear roughly through

the acquired membranes I have described, and so, to some extent, they restore the mesentery to its original length. The membrane must be accurately defined and then carefully dissected off or separated by firm pressure from the bowel and from the mesentery to which it is attached, the greatest care being taken not to leave the surfaces to which the membrane was attached bare of its peritoneal covering. When the mesentery has been restored to its normal length and the lumen of the bowel completely freed from any controlling or constricting influence, the surgeon must go carefully over the surface of bowel and mesentery from which the membrane has been removed, and if he finds any portion of the area freed from its peritoneal covering, he must cover it over perfectly, no place being left bare of a serous covering. In this way adhesions are avoided, and recurrence of the formation of bands avoided. Such recurrence of this development can only occur if the factors, which originally determined their formation, are allowed to continue in action, but this can be readily avoided by the proper free use of paraffin.

I know of no operation in surgery that affords the same remarkable benefit than does this if properly performed. A long median incision should be employed *for a thoroughly free exposure of the parts must be obtained.* It is impossible to carry out the necessary operative details with anything approaching accuracy through a small incision. After all the details of this most important operation have been attended to, the rest of the abdomen can be thoroughly investigated, and any result which was consequent on the presence of the obstruction at the first and last kink dealt with.

Bones and Joints.

By SIR JOHN LYNN-THOMAS, K.B.E., C.B., C.M.G., F.R.C.S.
Director of Surgical Clinic to War Memorial Hospital, Cardigan; Consulting Surgeon to the King Edward VII. Welsh National Memorial, etc.

SETTING of Fractures.—X-ray photographs are very rarely required, and do not materially assist in the art of setting fractures. A measuring tape and a trained sense of touch are infinitely more important. When asking "what is the shortening of this broken femur?" or "how much backward displacement is there in this swollen Colles's fracture?" the reply "I have not yet had time to take a radiograph" comes as a shock to those imbued with the practical astuteness of the old school. Further, it creates the feeling and fear that the sound, old, practical clinician has been temporarily eclipsed by the glamour of seeing the outline of the living bone which, after all, can be put right by the sense of touch and measuring tape, whilst not forgetting that the soft tissues which are not seen in the radiograph form the keystone to restoration of function. The modern general practitioner must take a leaf out of the old school, and rely upon his sense of touch and the measuring tape; dependability on a radiologist in ordinary cases does not foster better treatment; it should be reserved for the undiagnosable.

When the measuring tape indicates inches of shortening of the femur, the only way to restore normal length is by immediate extension, which may require hundreds of pounds' pull, and when restored fix the limb in a Thomas's splint after the Liverpool School fashion. A ten to thirty pounds' pull acting night and day over the end of a bed is not scientific, for it may or may not restore the limb to normal length;

it is a game of chance. "At one period we had 500 compound fractures of the femur, yielding an average shortening of less than half an inch, and in none of these cases was internal splinting resorted to." Without seeing a practical demonstration, it is almost impossible to carry out details of the method referred to, and it is here that the new school must emulate the practical side of the old apprenticeship days by giving individual training, as is done in a course of operative surgery. Open operations are not necessary and are to be condemned, except perhaps to-day in the hands of those experienced in such work. I have seen cases with 2 to 4½ inches shortening of femora after plating, and the limb restored to normal length by operation to remove the plates and refracturing the femur and treated on a Thomas's splint.

A "badly united fracture" is due to (*a*) incomplete setting; (*b*) inefficient splinting, *e.g.*, aluminium; (*c*) walking too soon, *e.g.*, lower extremity; (*d*) uncontrollable patient; (*e*) constitutional diathesis. It does not follow that function is necessarily bad. I have seen a farmer with fracture-dislocation of a shoulder refusing any treatment, and in two years' time doing all his work satisfactorily.

Splints.—The upper and lower limbs in cross sections are more or less circular, certainly always rounded; therefore, when a limb has to be encased in a splint, its shape should conform to the outline.

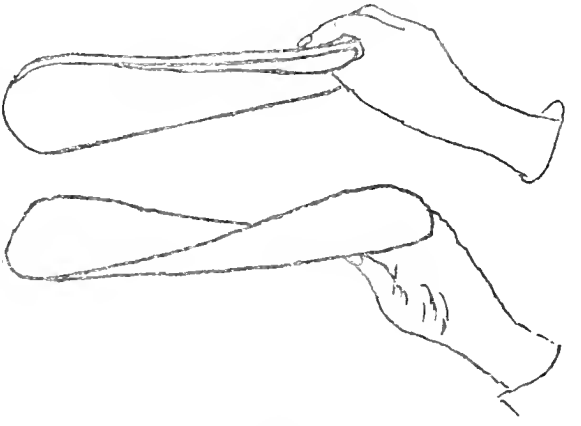

Fig. 1.

Flat wooden splints should be discarded, the only excuse for clinging to their use is their hoary antiquity, and should be replaced by "gutter" splints made of metal, light but strong enough to meet all the stresses splints are subjected to. Gutter-shaped splints have been used by many surgeons in special cases at different times; I am not aware that any one surgeon used them universally before H. O. Thomas and Robert Jones.

It is an important advance in the manufacture of splints. The most complicated type of splint can be readily made; for example, cases of severe injuries about the shoulder with paresis or paralysis of the upper limb are treated on an abduction splint, with a series of gutters fitting, the chest, upper arm, forearm and hand, joined together by iron bars, by which suitably placed gaps can be left for drainage and easy access for dressing wounds.

Gutter splints for the forearm must not only be strong enough to meet the longitudinal stresses but pliable enough to be moulded to the forearm by a slight spiral twist to the right or left (*see* Colles's fracture splints, Fig. 1), to maintain pronation. In Wales, we are having gutter splints made at the Prince of Wales's Hospital for Crippled Soldiers under the supervision of an orthopædic surgeon.

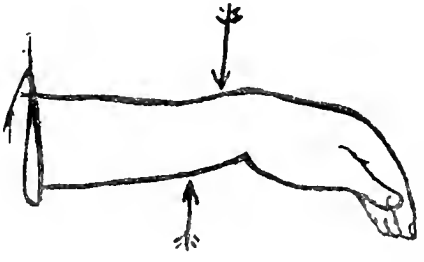

Fig. 2.

Fractures.—There are two fractures which call for special notice, viz., Colles's and Pott's.

How many ways are there for reduction and splinting a Colles's fracture? In the examination-hall there are very many methods, but in practice they are reduced to one, and is illustrated in Figs 2 and 3.

"*If the fracture is properly set, there is no fear of a stiff wrist.*

The surgeon, with his left hand, palm upwards, grasps the patient's left arm, placing the tubercle of his own scaphoid against the projecting lower end of the upper fragment; he then places his right hand, palm downwards, with the tuberosity of the scaphoid on the upper edge of the lower fragment, when, by a forcible pressure, the fragments are powerly replaced in position and crepitus is often felt. If the reduction is complete, the patient can at once move his fingers with less difficulty than before."[1]

FIG. 3 (Robert Jones method).

Pott's fracture is fairly easily reduced by bringing the foot into a varus position against a fulcrum applied inside of the lower third of the leg, and never forget also to manipulate the heel forward against a fulcrum applied to the shin in its lower third. These two movements are done with the knee fully flexed and fix foot in varus position. The flexed knee was one instruction given by Dupuytren in the after-treatment. Be careful to see that the full range of flexion of the ankle is maintained during convalescence; gentle movement of the toes on daily visit prevents stiffness, which follows long splinting. Take down the splint at the end of a fortnight when the effusion has disappeared in order to see that bone

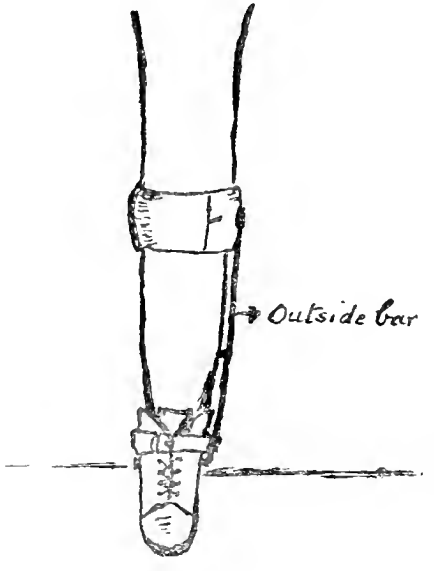

FIG. 4.

alignments are correct and put up in Plaster of Paris. Then the patient is allowed to get up and at the end of six to eight weeks time, according to age and weight of patient, an outside bar should always be fixed to the heel of the boot, and the inner side raised, as practised by Thomas for flat foot. A fractured inner malleolus or a ruptured internal lateral ligament takes months to recover; on that account it is essential to use the appliance referred to in Fig. 4.

Hallux Rigidus.—This incapacitating deformity is frequently overlooked, because there is no visible evidence of its existence until one looks for it. A man who complains of feeling pain and aching in his feet when walking, should be examined for dorsiflexion of the first tarso-metatarsal joint. When it is present, a Thomas's bar placed along the line of the tread of the boot works wonders in relief when walking. I have often seen men immediately after getting the bar fixed on their boots walk three or four miles without pain, after being incapacitated for months.

Fractures of the Base of the Skull.—Fractures of the base of the skull are generally associated with symptoms indicating brain lesions; irritability and frantic resentment of the slightest interference, with posture or attempts at cleansing nostrils and external meatuses on hands are well known. The very situation of these compound fractures prescribes direct antiseptic or aseptic attack; therefore, one is forced to make the best of a bad job, and is driven to the open, to try and circumvent the dangerous aggressors such as hands, and their surroundings of contact, *i.e.*, bedclothes, personal sleeping garments, hair on the head, and skin of face and neck, each of which is, surgically speaking, a source of infection. In order to reduce these fountains of infection to controllable limits, one is driven perforce to fall back on old trusted friends, tincture of iodine, carbolized or borated vaseline, sterile towels, and normal or hypertonic salt

sprays. The ears and auditory meatuses, fingers including nails, the nostrils and lips are immediately covered with Tinct. Iodi, and later on treated with the medicated vaseline; the bed-clothes are covered with sterile towels, which again are dusted with boric acid powder, as well as the hair, face, and everything else within reach of the restless hands. The nostrils and mouth are sprayed as often as opportunity arises.

When consciousness returns, one has to prescribe for the well-being of the ego. The musically inclined often get repose from music, reproduced by gramophone without a megaphone and with wooden pins; coloured pictures appease some, whilst puzzles or doing nothing may be the best treatment for others.

As an example, a boy of 8 years of age with a dolichocephalic skull (which is the most liable to transverse basal fractures), had hæmorrhages from both ears, both nostrils, and pharynx, followed by copious flow of cerebro-spinal fluid, and who was also stone deaf in one ear, recovered from all troubles, including deafness, without any reaction, when treated on these lines with daily doses of Hydrarg. c̄ cretâ., the stand-by of the old School.

Manipulation of Stiff Joints. — Joints receiving injuries are, as a rule, left too long to look after themselves, with the result that adhesions form without and, more rarely, within the joint. These cases form a wide field for brilliant results in the hands of manipulating surgeons, qualified or otherwise. A man falls on his shoulder and is given an application to rub in; he is not seen again for some weeks, when he complains of a localized pain, and frequently is given further treatment without examination and the testing of all-round movements of the shoulder-joint. The end-result is that he is then incapacitated, then gets in touch with one who tests the movements of the joint, and whilst so doing breaks down adhesions, with a distinct sound, which is interpreted as "a bone out of place" put back. A very useful way of breaking down some adhesions is to go through the manipulations recommended

for reduction of dislocation of the shoulder by Kocher's method; it is not always enough, because at times they are only broken down at full abduction, and that can best be done either by circumduction or by the foot-in-the-axilla method, whilst operating at almost right angles to the affected shoulder. The foot-in-the-axilla method is excellent when you use it cross-legged so as to get both feet to act, one on the scapula and the other on the joint and humerus. It is wise and advisable to get a radiograph taken to see whether there are hidden fractures of the humerus before starting forcible movement.

In all joints, forcible manipulations should be done thoroughly once and once only, then leave well alone, A series of half-hearted attempts at manipulation brings additional effusion around a crippled joint; if repeated, it means additional damage on each occasion to the joint, and in the end to the operator's reputation.

The Elbow-joint.—It is advisable in stiff elbows to give gas and oxygen, for patients are generally more sensitive than those with similar trouble in other joints. The forearm must be fully supinated and pronated, then fully extended and finally flexed to the full and tied, either to the neck with Thomas's halter or with strapping, as Fig. 5, for few days' rest, unless mobility is quite free and practically painless, when the patient is

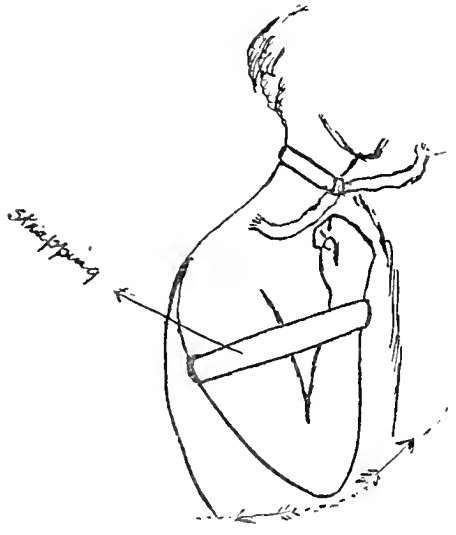

Fig. 5.

allowed to use it.

The Wrist.—The wrist is first fully flexed, abducted and adducted, then dorsiflexed to its full extent and kept in a cock-up splint until the patient can hold and use the wrist in that position.

The Hip.—Give anæsthetic—gas and oxygen as a rule. Manipulate as if trying to reduce every dislocation of a hip-joint. Rest if there is reactionary pain; massage.

The Knee.—Gas-oxygen anæsthetic as a rule. Fully flex, forcibly rotate the leg by grasping the heel, and then extend fully. You may have to repeat the manipulation if full extension is not obtained. Rest and massage if there is reactionary pain.

The Ankle.—When stiffness persists about the ankle after sprains, manipulation is not only confined to forcible flexion and extension of the ankle-joint, but also to rotation of the mid-tarsal joint, flexion and extension of the metatarso-phalangeal and inter-phalangeal joints.

Dislocation of the Shoulder.—I have tried at different times every method recommended for its reduction, and I yield the palm for general use to the misnamed heel-in-the-axilla method. "Foot-in-the-axilla" is a more appropriate name, for "heel" is "hinder part of the human foot below ankle" and that portion which is associated with Achilles has never been used for the purpose. I use both feet (Fig. 6), they form an expansile intelligent crutch, easily padded. For reduction of left shoulder the right foot is resting on the left and has the instep facing the chest; the position is reversed for reducing the right shoulder. The top foot forms an excellent

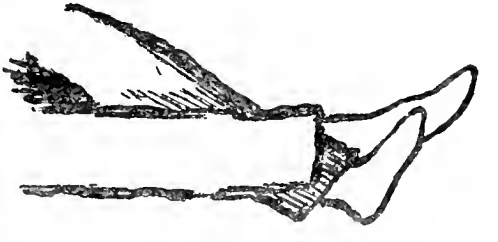

Fig. 6.

crutch for counter extension, whilst the toes are freely mobile to assist in "manipulating" the head into the glenoid cavity.

I reproduce from *Hamilton on Fractures and Dislocations*, Astley Cooper's method of applying extension, which I used successfully (Fig. 7) in a serious case in which ordinary extension could not be carried out because the humerus was also fractured three inches above the elbow on the dislocated side. An anæsthetic was out of the question, for the patient had a very bad heart and atheromatous

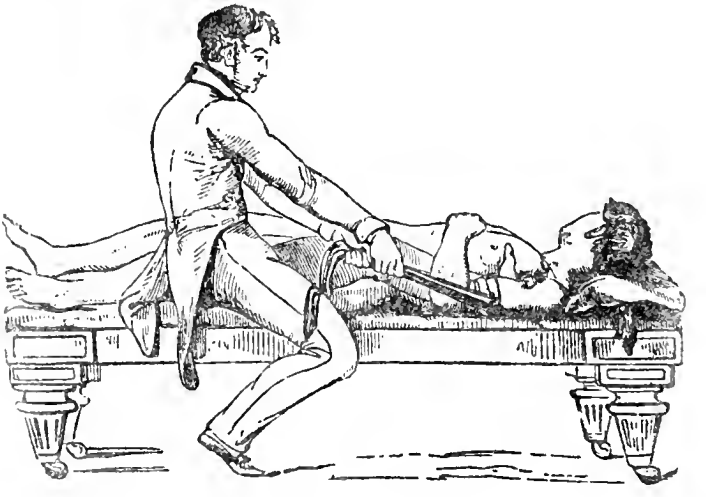

Fig. 7.

blood-vessels. In order to improve the grip of the arm a non-slip surface was made immediately below the folds of the axilla by means of wet bandages, and the ends of two scarves tied together to form a loop like that of a jack towel. After about a-quarter-of-an-hour's persistent pull, and the help of both my feet, the rejoicing click of reduction was heard.

Complications.—Complete and incomplete fractures of the upper end of the humerus are more frequently associated with the dislocation than was ever realized before X-rays threw light on a problem which had caused much argument, doubt, and disbelief in the

mind of surgeons who were authorities in the old school. In these very serious cases I wish to repeat again that the foot-in-the-axilla method gives a better chance to reduce dislocation than any other method. About 16 years ago, during the transition period from ignorance to positive proof of the frequency of the association of fractures with dislocation, I had an experience probably unique which vividly recalls the spirit of the times.

I saw in consultation a man who had a direct injury to skin and deltoid, and was told that the dislocated shoulder had been redueed before my arrival. The story convinced me of that fact, and the instant I moved the elbow I felt crepitus, diagnosed fracture near the joint, and advised treatment. Later on, to satisfy the patient, a radiograph was taken, which confirmed the diagnosis and did not alter the treatment. This X-ray photograph was the unfortunate means of starting a law suit, owing to the many doubting "Thomases" in the Profession. Two of this particular fraternity admired my loyalty to a colleague but airily ignored the possibility of the dislocation. However, the spirit of Nemesis was in the air, for one evening during the trial one of them fell and dislocated his shoulder and the other "Thomas" reduced it. The next morning, I was called in, and almost instantly said, "Ah! you have a fracture near the joint, and I have no opinion about the reputed reduction of the alleged dislocation of which there is no trace, except the statement of you both." The tragic-eomedy ended with two converts. At that time I saw many consulting surgeons who invariably admired my so-called loyalty to a brother professional, because they had only seen two or three cases during an experience much longer than mine. My invariable reply was, "You may be surprised to hear that I have treated five such cases within the last six months."

I wish to emphazise the point because it has a bearing on a method of reduction (Kocher's) which proved very successful in my hands, until I had a warning of its dangers by fracturing the humerus high up at the moment of reduction and in another discovering a fracture at starting rotation from the elbow. To-day I would not try Kocher's method, until I was convinced that the humerus was intact.

Elbow.—There is one golden rule which should be observed concerning injuries about the elbow-joint which are obscured by profuse extravasations of blood blotting out the bony landmarks, that is, never rest

and be satisfied until you can fully flex the elbow and get the hand to the position shown in Fig. 5. Avoid using flat wooden splints in all cases, for they have caused, or assisted in causing, life-long trouble through ischæmic paralysis. It will be noted that Scudder describes the case, see Fig. 8, as a "permanent deformity." I also shared that view until about 20 years ago Robert Jones told me that he had some success by a definite system of splinting, which aimed at restoring the contracted flexor muscles to their normal length, whilst giving the overstretched extensor muscles time to undergo interstitial shortening so that the balance of working harmony be restored. One starts by straightening the last joint then the next joints followed by the metacarpo-phalangeal joints, and finally the wrist-joint until the hand can be put and kept in the position indicated by Fig. 9. This position is all important, and should always be attained to get good functional results.

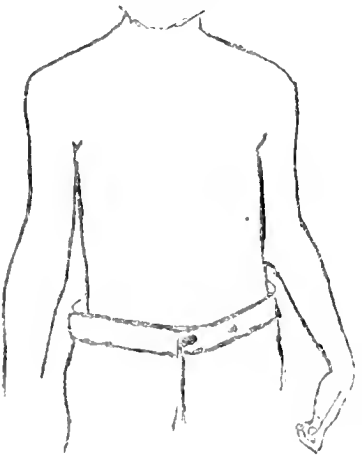

Fig. 8.

Fig. 9.

REFERENCE.

[1] *Proceedings of the Royal Society of Medicine*, December, 1910, by *Robert Jones, Ch.M.*

The Rectum.

By SIR C. GORDON WATSON, K.B.E., C.M.G., F.R.C.S.

Surgeon and Joint Lecturer on Surgery, St. Bartholomew's Hospital; Surgeon, St. Mark's Hospital for Fistula and other Diseases of the Rectum; Consulting Surgeon, Metropolitan Hospital.

THE student too often neglects to acquire a knowledge of rectal complaints at first hand, and when engaged in practice often finds his handicap too long to compete successfully with rectal problems. Errors in diagnosis are all too common because the methods of clinical examination are too often incomplete. It is not sufficiently well recognized that the use of a tubular speculum with a light attached is a most valuable aid to diagnosis, that the genu-pectoral position (in the male) renders examination by inspection much more easy, and that digital and bi-digital examination become increasingly valuable with constant practice. The amount of rectal work involving operations cannot be large in any average practice, and it is seldom possible for the average practitioner to acquire the special knowledge requisite for success in the majority of rectal operations. Operations for the treatment of hæmorrhoids, fissure, and ischio-rectal abscess fall to the lot of many in general practice, and some points bearing on the treatment of these conditions will be considered in this article.

Operations for Internal Hæmorrhoids.—The choice of operation for hæmorrhoids must depend to some extent on the experience of the operator as well as on the circumstances of the case. Excellent results can be obtained in experienced hands by either the methods of ligature, clamp and cautery, or Whitehead. The ligature operation is, perhaps, the

most suitable for all-round use, and is certainly easier, safer, and less severe for the patient than the Whitehead operation. The clamp and cautery is followed by less pain than either, and healing is quicker than after ligature; but it is not, perhaps, so suitable for extensive hæmorrhoids as ligature, nor is the technique so simple. The Whitehead operation should be reserved as a radical operation for the worse type of case, and only practised by those experienced in the operation. Minor cases can be effectively dealt with by the method of carbolic acid injection which produces thrombosis, but the risks attendant on thrombosis introduce an element of uncertainty.

The operative treatment of internal hæmorrhoids is usually regarded as minor surgery. As a surgical procedure an operation for piles takes minor rank, but from the patient's point of view, the pain endured renders the operation one of major importance. The success of the operation depends on attention to detail, in the preliminary preparation, operative technique, and after-treatment. These details are too often neglected in the training of the student, and so the general practitioner is too apt to regard the operation as one of great simplicity which requires no special attention to detail. Pain after operation for piles is a most uncertain quantity, and depends not a little on individual susceptibility, but it is safe to say that pain can often be minimized, if not eliminated, by avoiding undue stretching of the sphincter, by liberal incisions at the muco-cutaneous junction so that only the hæmorrhoidal vessels with the overlying mucosa are included in the ligature, by removal of all redundant skin to avoid œdematous tags, by strict attention to asepsis so that post-operative inflammation is reduced to a minimum, and by adequate preparation of the bowel beforehand, and careful dieting afterwards to avoid flatulent distension.

Secondary hæmorrhage, ulceration, and stenosis are complications which result from technical faults, or inadequate after-treatment, and usually the latter. In the best regulated hospitals these complications occur in a small percentage of cases. One case of severe secondary hæmorrhage or of ulceration followed by stricture might cause considerable damage to a practice.

The following are some of the points in preparation and after-care, which help to make an operation for hæmorrhoids run an uneventful course. Castor oil should be given two nights before operation, followed by a saline mixture in the morning. The evening before operation an enema should be given, and should be repeated if not clear. Immediately after the enema a mixture containing a drachm of catechu and 10 min. of tinct. opii is given, and on the morning of the operation, quite early, another dose of catechu mixture is given, and followed half an hour before operation by a hypodermic injection of $\frac{1}{6}$ grain of morphia and $\frac{1}{120}$ of atropine. No solid food is given on the day preceding operation, and eggs are not given for two days before operation. At the end of the operation an ounce of vaseline is squeezed into the rectum, and a small tube ($\frac{1}{2}$-inch diameter) inserted. The first day after operation diet is restricted to fluids, but on the following day ordinary light diet is employed.

The tube is left in for three days, unless the patient complains of it. It helps to keep down tags. If there is difficulty with micturition, the tube may be removed. The surface dressing is renewed on the first day, and on the second day all dressings are changed, and the area irrigated with peroxide. Wool rinsed out in 1 in 2,000 biniodide of mercury is used for the dressing. On the evening of the third day five ounces of warm olive oil are slowly injected into the rectum, and on the morning of the fourth day

an ounce of castor oil is given. After a Whitehead operation the aperient is delayed until the fifth day; the wound is irrigated four-hourly, and dressed with gauze soaked in 1 in 1,000 flavine. On the eighth day a digital examination is made, and the anal canal subsequently kept supple by periodic examinations up to the end of a month. The patient may be allowed up and out on the 10th to the 12th day after clamp and cautery, the 12th to the 14th after ligature, and from the 21st to the 28th after a Whitehead.

It is often urged against a Whitehead operation that stenosis frequently occurs. In the absence of serious sepsis this can always be prevented by gentle regular digital dilatation. Stenosis may easily occur after ligature if digital examination is neglected; it is very rare after the clamp and cautery operation.

The treatment of hæmorrhoids by *injections of carbolic acid* is a product of America, and was popularized in this country over 30 years ago, chiefly owing to Kelsey, of New York, who published a successful series of cases. Subsequently, Kelsey wrote as follows: "All that can be said of my own practice is that, while for a year or more I used it almost exclusively and was much pleased with its results, a succession of bad cases has led me to modify my views of its value and universal applicability, and although I now use it constantly, it is only on selected cases."

Most rectal surgeons at the present time will, I think, agree with Kelsey. They recognize that in selected cases, especially those who are much inconvenienced by a *minor* degree of hæmorrhoids and who are unable to afford either the time or expense necessary to undergo an operation, or are unsuitable cases for a general anæsthetic, that the method is a valuable one. On the other hand, they realize that the possibilities of unpleasant complications are less easy

to guard against and more prone to arise, than after operation by ligature or clamp and cautery.

The great advantage claimed for the method is that the patient need not lie up, and that he can attend to his business while under treatment. If this claim could be substantiated as practically free from risk, and if the method could promise the same ratio of cure as operation by ligature, then indeed it would find much more favour with surgeons. Harrison Cripps summed up the situation as follows: "It appears to me entirely opposed to sound surgical principle to inject an irritating material into venous structures and then allow a patient at once to expose himself to the exigencies of ordinary life. To commence the day with an injection of carbolic acid into the venous tissues of the rectum, to continue it by a hard day's work, and to end it with a little convivial entertaining in the evening, is to court disaster." If the method is employed, strict attention to detail is essential. A 20 per cent. solution of carbolic acid in equal parts of glycerine and water is usually employed. A short proctoscope is inserted and gradually withdrawn until the piles prolapse within the lumen. After swabbing with spirit a few minims (not more than five) of the solution are slowly injected into the centre of one or two (at most three) of the hæmorrhoids. If prolapse occurs after injection, the piles must be returned at once to avoid strangulation and sloughing.

It is usually claimed that patients can safely continue their occupation, if not strenuous, after the injection; but it is far wiser to recommend the patient to lie up for two days after injection. The practitioner will also be on safer ground if he is content to treat one hæmorrhoid at a time.

The Inflamed and Thrombosed External Hæmorrhoid.—The pain and discomfort, especially on defæcation,

associated with this condition are out of proportion to the gravity of the complaint. The remedy, like the complaint, is simple and the relief secured should carry in its train gratitude in proportion to the suffering endured. The treatment of a painful and inflamed external pile is the same as for a subcutaneous hæmatoma elsewhere, and consists in turning out the clot after incision and then cutting off the overhanging edges of skin. This can be done painlessly after injecting a few minims of a 1 per cent. solution of novocaine, or after spraying with ethyl chloride. With strict attention to cleanliness no further trouble need be expected. Pain is relieved at once and healing occurs rapidly.

If the inflammation is of some days standing and has spread beyond the limits of the pile, or if suppuration has occurred, the patient must be confined to bed and incision, which should be limited to the relief of tension, followed by fomentations or antiphlogistine poultices. The inflamed perianal pile must not be confused with the inflamed and prolapsed hæmorrhoid proper. Whenever a hæmorrhoid prolapses, it should be replaced within the sphincter, but if inflammation occurs or prolapse constantly recurs, an operation under general anæsthesia is advisable. Inflamed and prolapsed hæmorrhoids, which threaten to become gangrenous, may call for immediate attention from the practitioner. With the onset of gangrene the pain associated with prolapse and inflammation is relieved, but there is a danger of portal sepsis, and I have seen both pylephlebitis and hepatic abscess follow this condition.

Gangrenous prolapsed hæmorrhoids may be dealt with under general anæsthesia after gentle dilatation of the sphincter, either by ligature or by clamp and cautery. I have a preference for the latter in cases of gangrene, and consider it is a safer method in the

presence of sepsis.

Fissure in Ano.—The pain of a fissure is out of all proportion to the gravity of the malady. Because the anal canal is richly supplied with sensory nerves, a tear in the lining gives rise to intense pain during the act of defæcation, pain which often lasts for a considerable time owing to the reflex spasm of the sphincter. Attempts to cure any but recent and slight fissures by palliative means are usually ineffectual, or give but temporary relief. The only certain method of cure is by incision of the external sphincter, so as to put the muscle out of action until the fissured area has healed. Simple stretching of the sphincter in slight cases may suffice, if care is taken to avoid hard motions. When incising the sphincter it is important to cut out through the skin well beyond the anal margin, removing the œdematous tag of skin, "the sentinel pile," which is usually present. A lozenge-shaped wound results after the overhanging edges have been cut away; this is allowed to granulate up from the bottom.

An anal fissure is a common cause of pruritus ani. If the fissure is neglected, and the pruritus becomes chronic, it may be easier to cure the fissure than the pruritus. It often happens that patients are unwilling or unable to lie up and submit to operation. In these cases, relief, and sometimes cure, may be secured by using a fine electric cautery to cut through the base of the fissure under local anæsthesia. Fissures are very liable to recur unless constipation, which is the usual cause, is carefully avoided after operation. It is well to remember that a fissure may be complicated by polypi or other conditions higher up, which may not be recognized, because overshadowed by the painful fissure, unless a thorough examination is carried out under anæsthesia.

Ischio-rectal Abscess.—Pus may accumulate in the

ischio-rectal fossa but may cause little pain, and so fail to be recognized until it comes to the surface and the skin begins to show signs of inflammation. The amount of pus which the fossa will hold, is very considerable, sometimes amounting to a pint. An ischio-rectal abscess calls for early incision and drainage. It is a mistake to wait until the abscess points. The ischio-rectal fossa, when filled with pus, may be compared to the inside of a tennis ball, a more or less spherical cavity with its wall bulging towards the rectum, the pelvic floor, and the perineum. The walls of the fossa, like those of the ball, do not readily collapse when the cavity is incised. To secure rapid healing of a large abscess every effort must be made to obliterate the cavity. The most satisfactory method, is to remove the area of skin forming the floor of the abscess and so to convert a sphere into a hemisphere, or flat saucer. A crucial incision should be made with the centre over the most prominent "point" of the abscess and the four radii extended to the margin of the abscess. These four points of the compass are then connected by cutting away the flaps of skin. In short, the largest available circular opening is secured, the abscess cavity is thus flattened out, and should heal quickly. No harm results from the loss of skin. It is an axiom in the surgery of ischio-rectal abscess and fistula, that the more skin removed the more sure and swift the cure. When the abscess is very acute and the temperature high, it is sometimes wiser to treat the abscess in two stages. A small incision may be made under gas or the ether spray, to relieve tension; the acute phase will subside in a day or two, when more radical measures may be employed.

It should not be forgotten that these abscesses are sometimes bilateral, one side only may be pointing, and the other side not recognized. Further, some originate from anal trauma plus infection from the

bowel, and have, in consequence, a communication with the bowel. When this is the case healing will not be complete until the tissue intervening between the internal opening and the anal margin has been divided, which usually, but not always, includes the external sphincter. It is best, however, to allow the abscess to settle down before dealing with the opening into the bowel, in conformity with the general principle of not dividing more healthy tissue than is absolutely necessary when suppuration is active.

It occasionally happens that the practitioner is called upon to remove a fish bone or some other foreign body which is impacted in the anal canal and is causing intense rectal pain. This may sometimes be quite easily accomplished (though not without great pain) on digital examination, or it may require an anæsthetic and the stretching of the sphincter. It is worth remembering that ischio-rectal abscesses follow injuries of this nature, and the patient should be warned to present himself for further inspection at a later date.

Not long since I attended an elderly gentleman, who was writhing with rectal agony. I found a small rabbit bone impinged across the anal canal and perforating the sphincter on either side. I warned him of the possibility of an abscess to follow, and in due course he presented himself (having postponed his visit as long as possible) with an abscess bulging out into either fossa.

In some instances foreign bodies are found when opening an abscess, and it is well to be on the look-out for a fishbone, or the like, embedded in the abscess wall. If not found, it may remain to establish a fistulous track. Ischio-rectal abscess sometimes follows a minor operation on the rectum, and with the attention focussed on the operation area, may, at first, escape detection. Other conditions may simulate abscess.

Some years ago, a patient was sent up to my out-patients at St. Mark's, with the diagnosis of ischio-rectal abscess. On examination, it was found that the bulging swelling was no abscess, but a large myeloid sarcoma growing from the ischium. The diagnosis

was rendered easy by well-marked egg-shell crackling, the classic sign which is so often absent. In other instances suppuration in the ischio-rectal fossa may be secondary to malignant ulceration of the rectum, and, indeed, may sometimes be the first indication of the disease, though usually a late manifestation.

Tuberculous ulceration of the rectum is prone to spread to the ischio-rectal fossa, and when it does, the patient is usually extremely ill and often the victim of advanced phthisis. In such cases operative treatment should be limited to the relief of pain and tension. On the other hand, a certain percentage of chronic fistulæ (which are usually preceded by abscess) are found to be tuberculous on section or after guinea pig inoculation, though, clinically, the patient is not "tuberculous." These cases respond well to radical treatment. Enough has been said to indicate that ischio-rectal abscess, if treated as an operation of general practice, must be treated with respect and consideration, and not least because it is the father of all the fistulæ in ano.

Fistula in ano, though a common complaint in hospital practice, is comparatively rare in the better class practice. It is perhaps the most neglected disease in existence. Patients of the poorer class will endure the daily staining of their "linen" for years on end, while the fistula burrows up hill and down dale. Surgeons will pass the bed of the F.I.A. with a pious prayer for his speedy recovery, but with a hope deferred and a heart sick at the blocked bed. These cases can be cured, with certainty, in experienced hands, but, the operation is too often considered a minor operation, and relegated to a resident, who lacks the special experience. Quite half the cases admitted to St. Mark's for fistula in ano have been operated on elsewhere, and often more than once. Operations for fistula in ano in general practice more often than not will fail to enhance the reputation of the practitioner as a surgeon.

Genito-urinary Operations.

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AMONG the most painful and distressing maladies that come under the notice of general practitioners are some genito-urinary diseases. In many of these cases relief is often urgently needed, and by applying treatment including—in cases in which they are indicated and necessary—operative procedures, the general practitioner can often afford more or less immediate relief and so tend to lessen the painful and exhausting complications with which many cases of urinary disease are prone to be associated, especially when they have been neglected.

The task which I have with pleasure accepted, in this Special Number of THE PRACTITIONER, is briefly to review genito-urinary diseases, their symptoms, diagnosis, and treatment in a manner which will be helpful to general practitioners, especially in those cases which may require operative measures for their relief.

It is generally acknowledged that the general practitioner of to-day is a very different man from what he was 40 years ago, for not only is he far better educated, but owing to the Great War many have had considerable operative experience either in the Army or by temporarily filling various hospital appointments. I therefore consider that there are not many operations in genito-urinary surgery which are beyond

the powers of the general practitioner to carry out successfully. If such feels that he is competent to undertake a given operation, and that the patient will stand as good a chance, or nearly so, as in the hands of the specialist, he is perfectly justified in performing such an operation, and all the more so if it is one of emergency.

There are, however, at least two operations which I think, in the interest of the patient, should, where possible, be limited to those who have experience of them. I refer to *Litholapaxy* and to *Enucleation of Prostate*. Both are done out of sight, and by the sense of touch. To manipulate a lithotrite with skill requires considerable experience, and would entail more risk to the patient in inexperienced hands than a supra-pubic lithotomy. The same applies to prostatic enucleation, although here no special instrument is used. It is only by experience that the finger becomes educated to distinguish the proper plane of cleavage, viz., that between the capsule and prostatic sheath. It is within the experience of most urinary surgeons that the mortality following this operation decreases as the number of cases operated upon increases.

The subject of genito-urinary surgery is such a large one that I cannot possibly deal with it fully in the space allotted to me. I shall therefore content myself with mentioning those symptoms for which the medical man is most often consulted and indicating, where necessary, the various operative procedures required for the lesions causing these symptoms. Finally, I propose to call attention to various acute affections and injuries in which prompt action by the general practitioner may avert further disaster.

Of all genito-urinary troubles I suppose the most frequent one for which the doctor is called in is some disturbance of the act of micturition, whether of diffi-

culty, inability, frequency, pain, hæmaturia, and incontinence. The most urgent of these is inability, for this means retention.

Retention of urine may be complete or incomplete, and indicates obstruction due either to stricture, enlarged prostate, blockage of urethra by stone, blood-clot, or to inflammation of urethra or prostate.

Retention of urine in *childhood* is generally due either to phimosis or to an impacted stone in the urethra. With the phimosis there is often a congenital stricture of the meatus. Circumcision and a meatotomy are indicated. For retention due to stone, *see* paragraph under Old Age. In the young adult a sudden retention is usually the outcome of an acute gonorrhœa. In such a case catheterism should be avoided for obvious reasons. If the condition is not relieved by a morphia and belladonna suppository followed by a hot bath, the bladder should be aspirated above the pubes, and this may be repeated as often as is necessary.

In *adults of from* 35 *to* 50 *years of age*, there is usually a history of stricture, *i.e.*, a diminishing stream with forking and twisting and often dribbling, a certain amount of gleet and some threads in the urine. Complete retention in such a case is due to an access of inflammation in the urethra, with probably some spasm. Here catheterism may be attempted if the hot bath has failed, but the method which I have found of most use is as follows: Cleanse the urethra by injecting a little hot boracic solution, then inject a local anæsthetic, either a solution of novocaine or one of cocaine and eucaine, in a 5 per cent. solution of each, and retain it for a few minutes. A well oiled filiform guide bougie of a Harrison's dilator should now be passed trying a straight one first; if unsuccessful take one with a corkscrew end and try again. This is usually successful, if sufficient time

is spent in the manipulation. Now screw on the dilator and with care pass it on into the bladder. The bolts are now passed beginning with the smallest. If much force is required be content with this or with the next largest bolt. The urine will be escaping slowly through the central tube, when once the instrument is in the bladder. But should this not be the case, three courses are open: (1) Remove the dilator but leave the pilot bougie *in situ*. Its presence will cause the stricture to dilate and urine will escape around it; or (2) pass a pilot belonging to a Maisonneuve's urethrotome and at once proceed to do an internal urethrotomy, but this will need an anæsthetic. This is the course I usually adopt in hospital when a pilot bougie can be passed; or (3) remove the dilator and try to pass a pilot, a whip, Coudé or silver catheter. If unsuccessful with either bougie or catheter, the urine must be withdrawn by supra-pubic aspiration or by trocar and canula.

In *old age*, that is in men over 60, retention is usually due to enlarged prostate and comes on gradually. When it becomes complete it is usually owing to some superimposed congestion caused by a chill and the consumption of alcohol, or it may be due to hæmorrhage from large and turgescent veins over the prostate, clot forms in the bladder and blocks the internal meatus. This is called clot-retention.

In both varieties relief by catheter, under strict aseptic precautions, is indicated. A Coudé catheter about No. 18 French gauge should be tried in the first instance, and if successful the urine should be drawn off quite gradually, an hour or two being spent in emptying the bladder. If a Coudé will not pass, try a bi-Coudé, or a No. 12 silver catheter with a large curve. If this is in vain, aspirate or puncture above the pubes.

In a case of clot-retention the mere passage of a

catheter may be insufficient, for it may get blocked with blood-clot. An endeavour may be made to pass a large No. 14 or 16 evacuating canula, and with a rubber bottle suck out the clots. Failing this a supra-pubic cystotomy is the best course, for it enables one to evacuate all clots, to examine digitally the bladder and intravesical portion of the prostate, and with the finger of the other hand in the rectum, *i.e.*, by a bi-manual examination, the whole of the prostate may be examined and information be obtained about its size, consistency, and mobility. If necessary, the whole proceeding may be carried out under infiltration anæsthesia. A large supra-pubic drain, $\frac{3}{4}$ to 1 inch diameter, is left in. After an interval of a few days, the prostate may be removed if it should have been found a suitable case, viz., a simple adenoma.

Retention of urine, alias *a distended bladder*, may also be caused by obstruction due to a stone or foreign body impacted in some part of the urethra. If it is in the prostatic, urethra, the passage of a full sized Coudé catheter, aided with the finger in the rectum, will often succeed in pushing it back into the bladder, where it can be crushed and then evacuated or removed by supra-pubic lithotomy. If the stone is in the penile urethra just behind the glans, it can usually be extracted by forceps or scoop, aided possibly by a meatotomy. In cases in which it cannot be manipulated either backwards or forwards, it must be exposed by an incision over it, removed, and the wound carefully closed. An inlying catheter is advisable for a few days, after which catheterism two or three times a day until the wound is healed. Do not lose sight of the fact that retention, likewise incontinence, may be due to a central nervous lesion such as locomotor ataxy. Incontinence, however, is generally due to overflow and indicates a distended bladder.

Hæmaturia, another symptom of urinary trouble,

is one for which the medical attendant is often consulted, but I will exclude the medical aspects of this symptom. It may arise in any part of the urinary tract, and may be due to stone in the kidney, ureter, bladder, or urethra. When in the kidney, bladder, or ureter, radiography and cystoscopy are invaluable for diagnostic purposes. When renal, as shown by the intimate mixture of urine and blood and by other symptoms such as pain in the kidney, tenderness, and swelling (stone has been excluded), malignant disease, simple papilloma of pelvis and angioma of renal papilla, and even tubercle must be borne in mind. These diseases are of gradual onset and therefore do not necessitate immediate operation, but should it be necessary for the practitioner to operate nephrotomy, nephrolithotomy, nephrectomy, and uretero-lithotomy will be found fully described in the text-books, and therefore I will not discuss them in this paper. Hæmaturia, often profuse and unaccompanied by other symptoms, usually points to vesical papilloma, which may be single or multiple, small or so large as to fill the entire bladder. The only cure for this condition is removal either through a supra-pubic opening or, where the growths are small, by electric cautery through an operating cystoscope, but this requiring, as it does, considerable experience, should be left to the specialist. Supra-pubic cystotomy for the removal of papillomata is described in most text-books, so I will merely emphasize one or two points. Trendelenburg position. A good headlight. Free opening of bladder, which must be stripped as much as needs be of its peritoneal covering. Good retraction. A careful inspection of the whole of the vesical mucosa, for these growths are often multiple and may spread over a wide area, a fact which is probably known to the operator by a previous cystoscopic examination. Free excision of each papilloma, including its base, followed by suture

of each wound by fine catgut. When all bleeding has ceased, the bladder wound should be sutured, leaving only sufficient space for the insertion of a good-sized drain.

Hæmorrhage from the urethra of any magnitude is usually traumatic, following a blow or fall on the perineum, or due to an operation such as an internal urethrotomy for stricture. In the former case the urethra is usually ruptured, and if not attended to forthwith is sure to be followed by extravasation and all its ills. The symptoms of ruptured urethra depend to some extent on the size of the rupture, and whether this has been sudden or a gradual process. When gradual, it is due to an ulcerated mucous membrane behind a stricture giving way under pressure during micturition, and allowing a drop or two of urine to escape into the peri-urethral tissue. This leads to inflammation and the formation of a perineal abscess. If such an abscess is merely opened, a urinary fistula will result. The proper course is not only to incise and curette the abscess, but at the same time to divide the stricture by either an internal or an external urethrotomy (preferably the former) afterwards tying in a 22 or 24 Coudé catheter, through which the bladder should be washed out two or three times in the 24 hours with warm boric solution, at the same time irrigating the perineal wound. The catheter should be changed every three days until the perineal wound is nearly healed, when it may be left out and the urine withdrawn by catheter when necessary.

The symptoms of a *ruptured urethra* due to a fall or blow, are bruising and swelling of perineum, difficulty or inability to urinate, and the escape of blood from the meatus; there is also the history of the injury. The local condition will largely depend on the time that has elapsed since the receipt of

the injury. If long delayed, symptoms of urinary extravasation will be definite, much swelling of perineum, scrotum, even extending to the iliac and suprapubic regions, with sloughing of subcutaneous tissue and skin. Here free incisions are necessary, and irrigation with 1 in 2,000 sublimate solution, and hot boric fomentations, and, if available, immersion in a hot antiseptic bath. On subsidence of the inflammatory condition, repair of the urethra may have to be undertaken. When seen within a short time of the injury and the diagnosis leaves no doubt that the fixed urethra is ruptured, a perineal section should be performed as soon as possible.

Lithotomy position. Thorough washing of the perineum, followed by the application of a 3 per cent. solution of tincture of iodine. Longitudinal incision of perineum from the base of the scrotum to within an inch of the anus, deepening this to expose rent in urethra. Cleanse wound by removing all blood clot. Apply tissue forceps to edges of laceration in urethra. Pass a No. 22 Coudé catheter from the meatus through the urethra out at the wound. If the urethra has not been completely severed it may be easy to pass the catheter on into the bladder. After irrigation of this and the wound, the rent in the urethra should be closed with fine interrupted catgut sutures and the wound closed in the ordinary way, only leaving in a small drain in case of any leakage. The catheter should be left in for three or four days and then replaced by others, or resort may be had to catheterism.

In cases in which the urethra is completely ruptured, great difficulty may be experienced in passing the catheter into the posterior urethra. A good headlight is of advantage. Before attempting to pass onward the catheter, endeavour to recognize the edges of the proximal urethra, and, if seen, seize them with

tissue forceps and hold them apart, and pass on the catheter. If the edges of the deep urethra cannot be defined, pressure on the bladder (which is usually distended) may cause an escape of urine into the wound and thus indicate where the deep urethra is. Failing this, carry out a supra-pubic cystotomy with retrograde catheterism. When the catheter from the bladder has emerged into the wound, its end can be sewn to the end of the catheter which has already been passed into the wound through the external meatus and used to draw the latter into position. The ruptured urethra should be repaired as far as possible and the operation completed as above. Do not forget that a stricture is very likely to follow a ruptured urethra, therefore the doctor should keep his patient under observation, and pass a 12 or 14 steel bougie at intervals. When the bladder has been opened above the pubes, should it be closed or drained? I, personally, think perineal repair will be accelerated if supra-pubic drainage is maintained for two or three weeks.

There are yet two other lesions causing hæmaturia for which the practitioner may be called on to operate, viz., *rupture* either of the *kidney* or of the *bladder*.

As an illustraion of the former, I will narrate a case to which I was called some years ago by Dr. Sidney Bontor, of Berkhamsted. A lad, 11 years of age, was indulging in the sport of tobogganing, when he ran into a tree, causing severe bruising of the right loin, shock, much pain, and hæmaturia. It was clear that there was an injury of the kidney. I saw the case three days after the accident, when all hæmaturia had ceased. There was resistance in the right flank and no abdominal movement on respiration. Examination under an anæsthetic revealed a large elastic tumour in the right renal area. Operation: lumbar incision. Evacuation of blood-stained fluid and much blood-clot. The kidney was found with the lower pole, *i.e.*, nearly the lower third, crushed off, the fragment being embedded in clot two inches from the kidney in the iliac fossa. This was removed and the area thoroughly cleaned up. I did nothing to the kidney, for all hæmorrhage had ceased. The wound was closed after having inserted two large rubber drains and some gauze packing. The next day urine was escaping freely from the wound, but this gradually ceased and a

month afterwards the wound had completely healed. I heard, some years afterwards, that there had been no further trouble and that he had grown into a fine and healthy young man.

Had I found a lacerated wound, I should have sewn it up with catgut sutures passed deeply through the kidney substance. As a rule, all bleeding from the wounded kidney has ceased by the time an operation takes place, but, if not, determine the spot, if possible, and tie the bleeding vessel. Should this not succeed, pass a deep mattress suture of catgut which usually is quite effective. If the kidney is found to be irreparably damaged, it must be removed.

Rupture of the bladder is a serious condition and calls for immediate surgical attention. It may be either intra- or extra-peritoneal, or a combination of both. It usually occurs from a fall, blow, or kick on a full bladder, or may accompany a crushed pelvis, in which case the outlook is not promising.

I remember the case of a man being admitted to St. Bartholomew's Hospital, when I was house surgeon there, for hæmaturia and much difficulty in micturition. It appeared that during a fight with a man, he was kicked in the lower abdomen. He had been drinking over night and the fight took place in the early morning, without the patient having voided urine. The case was one of ruptured bladder, which after some days proved fatal. His opponent was tried for manslaughter but was acquitted, as it was proved that the deceased's wife (who went to her husband's assistance when both combatants were on the ground) had kicked her husband instead of his antagonist, as she intended, and had thus caused the death of her own husband.

The *symptoms of intra-peritoneal rupture* are, in addition to the history of the injury, desire to micturate and more or less inability to do so, blood-stained urine, if any. These symptoms should be confirmed by the passage of a steel sound up to its hilt, its point being felt in the peritoneal cavity under the abdominal wall, also by the injection of a given amount of fluid through a catheter, which fluid, or the greater part of it, fails to return.

In *extra-peritoneal rupture* the last two tests may

not yield much information. Rupture of the organ having been diagnosed, the sooner the bladder is opened above the pubes the better. If shock is not excessive, and the urine not septic, prognosis should be favourable if a speedy operation has been performed, with a view to draining the bladder and removing all urine from the peritoneal cavity. If, however, a ruptured bladder is complicated with a fractured pelvis, as is often the case, the outlook is very grave, especially if the urine is already septic. If the rupture is extra-peritoneal, or partly so, extravasation will take place into the pre-vesical space and cellular tissue about the bladder. This entails free supra-pubic drainage, in addition to closure of the bladder, and drainage through an inlying catheter.

Prostatic abscess is generally due to gonorrhœa, and should be opened if it threatens to break into the rectum, or to track upwards into the pelvi-rectal space, *i.e.*, between the rectum and levator ani, where it may form a large abscess before finally opening high up into the rectum. In the former case, *i.e.*, where it bursts into the bowel below the levator, the result may be a recto-urethral fistula, whilst in the latter a high-lying blind internal fistula for the cure of which considerable technical knowledge is required.

The symptoms of a prostatic or peri-prostatic abscess are heat and weight in the rectum and perineum, pain and difficulty in defæcation and micturition, accompanied with high temperature and often with rigors. If gonorrhœal in origin when symptoms of prostatitis supervene, the urethral discharge usually disappears or becomes almost negligible. A digital examination *per rectum* will reveal a large, elastic swelling at the site of the prostate in a case of periprostatic abscess, whilst in prostatic abscess the

prostate itself will be found to be swollen and tender, with one or more tense and elastic areas. Retention of urine may accompany both conditions but is more likely to be met with in the latter.

The best method for opening a prostatic abscess is as follows. Lithotomy position. Careful preparation of skin of perineum. The operator's left index finger should be passed into the rectum with its tip on the swelling. A straight bistoury is now inserted, about an inch anterior to the anus, in the midline, and, guided by the finger in the bowel, is pushed on into the abscess. The perineal opening is enlarged upwards in the act of withdrawing the knife. If pus is not escaping, insert a probe-pointed director through the wound into the abscess, again guided by a finger in the rectum, and along the director pass a pair of compression forceps, open the blades and withdraw. After the pus is evacuated insert a good sized rubber drain, and suture it to the edge of the wound.

I might mention that when the abscess is in the substance of the prostate and causing much obstruction to micturition the passage of a catheter often ruptures the abscess, the pus being discharged into the urethra. The abscess will gradually close, but may need prostatic massage combined with the instillation of a solution of nitrate of silver before a cure is effected.

I have now touched upon most of the lesions for which the aid of the practitioner is likely to be urgently needed, and although there are many text-books on the subject I trust that the classification here employed may be helpful to many of my professional brethren.

Gynæcology and Obstetrics.

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I OFTEN think that in the interests of womankind this additional supplication should be added to the Litany "From the uterine curette and the obstetric forceps, Good Lord Deliver Us." Curetting and delivery by the forceps are the most common operations performed upon women by doctors in general practice and, as a fact, they are very frequently performed. Both these operations are generally regarded as very easy and devoid of danger, but it will be my object to show that this is not by any means the case.

CURETTING.

Women are constantly being curetted in whom there is not the least indication for the operation. The practitioner, therefore, before curetting his patient, should satisfy himself by a consideration of the history and symptoms by a thorough bimanual examination, and if necessary a vaginal examination, that the condition for which advice is sought, owes its origin to some local disease of the mucous membrane only. Such diseases, therefore, as chronic endometritis, mucous polypi, subinvolution with or without retained products, and leucorrhœa, are rightly and successfully treated by a curetting. On the other

hand, curetting is quite frequently performed for cases in which, if the practitioner had made such an examination as detailed above, fibroid tumours of the uterus, fibrosis of the uterus, fixed retroversion of the uterus, or diseased uterine appendages would have been found, and consequently the operation must be a failure. Lastly, the operation is most commonly and uselessly performed for symptoms in association with which no abnormality can be discovered on local examination, such as congestive dysmenorrhœa, excessive hæmorrhage, and some cases of sterility through ignorance of the pathological condition, whilst, in many cases the operation is inefficiently performed with such disappointing results as in the case of leucorrhœa.

Some few days before the period is due the pelvic organs are flooded with blood. This extra amount of blood has to be and is accommodated by a certain degree of swelling of these organs. It necessarily follows that the nerves supplying these organs are stretched and a certain amount of discomfort or pain results. Now the nervous system in its resistance to pain varies remarkably in different individuals, and what one woman will describe as agonizing, another will cursorily dismiss as a slight discomfort, although in each case a thorough examination fails to disclose any abnormality. Most women have learned to regard this pain as normal, and, especially if they are occupied, take no notice of it. The nervous system of some women, however, cannot put up with this extra tension and they suffer unduly. This condition is termed congestive dysmenorrhœa.

It will be obvious, therefore, that the operation of curetting for congestive dysmenorrhœa is bound to lead to disappointment both to the patient and her medical adviser. Why, then, is this operation so frequently employed for such a condition? Probably in many cases because the doctor has noticed that

a certain amount of relief is obtained. If, however, the histories of those cases which are relieved are gone into as carefully, it will be found that most of the pain is due to the condition called spasmodic dysmenorrhœa. But even then it is not the curetting that has relieved the pain, but the dilatation of the cervical canal which is a necessary preliminary to the operation, for it is obvious that removing the mucous membrane of the uterus cannot prevent this premenstrual congestion, neither can it influence the nerve supply of the uterus, ovaries, or Fallopian tubes. It necessarily results, therefore, that the disappointment so often associated with the curetting could easily be prevented if the practitioner would only correctly diagnose the variety of dysmenorrhœa with which his patient is afflicted. Many women suffer from excessive hæmorrhage, in whom a local examination fails to disclose any condition which might justifiably be attributed as the cause. Such bleeding for instance as is due to some general condition of the patient, or perhaps some abnormal working of the endocrinal glands. In these the operation will do no good at all, and, moreover, supposing, as is not unlikely, that the bleeding gets worse, the curetting will by many patients be held responsible.

Certainly the operation is often performed in cases of sterility in which the practitioner has failed to prove that the husband is not at fault. Yet an examination of the husband's seminal fluid can be made with very little trouble. If the husband has coitus in the morning with the aid of a condom, and the imprisoned seminal fluid is then wrapped round with cotton wool and sent at once to be examined microscopically, and the secretion is placed on a warm stage, there is very little chance of the spermatozoa dying before they are examined. Now considering it is calculated that in at least 10 per cent. the fault lies with the husband,

it must be admitted that it is almost criminal to subject a woman to the discomfort, dangers, and expense of a curetting before an examination of the semen of her husband has shown that the spermatozoa are healthy. It cannot be denied, however, that when the spermatozoa are healthy and in the absence of local disease, the operation of curetting occasionally meets with signal success in cases of sterility in women. But here again, it is an open question whether it was the removal of the mucous membrane that led to success, since the same successful result just as often follows a simple dilatation of the cervical canal. Some authorities, it is true, maintain that an essential factor is the curetting, on the simile of a gardener freshening up the top earth by raking it before he plants his seeds, or as a student at the Conjoint Examination put it "a new wall paper may attract a tenant."

Lastly, we come to leucorrhœa. This is probably the commonest sympton for which the operation is performed. The reason why the operation so frequently fails is because the practitioner does not realize the true pathological significance of the complaint. A few facts will serve to make this plain.

The normal discharge escaping from the vagina consists of a yellowish-white sticky fluid. Its viscosity is due to the secretion of the glands of the cervical mucous membrane, the mucus escaping from Bartholin's gland may be disregarded as it is only likely to be excessive under sexual stimulation. The colour is due to the presence of fatty degenerated epithelial cells which have been shed from the vagina. A few days before menstruation and during pregnancy, the mucous glands are unduly active and the resulting discharge causes, in some women, a certain amount of discomfort. A leucorrhœal discharge in excess of this and at other times, sufficient in quantity for instance

to necessitate the use of a diaper, is abnormal and requires treatment.

Now if an efficient examination is made, it will be found that an excessive leucorrhœa is due to chronic inflammatory disease of the cervical mucous membrane, and an "erosion" is often present. Women who have borne children quite commonly complain of such a symptom, whilst virgins not infrequently do so. In such, an examination of the lining of the body of the uterus will disclose the fact that the endometrium is quite healthy. The discharge from the mucous membrane lining the body of the uterus is clear and watery and in excess is associated with chronic endometritis, and although women suffering from the latter complaint may have a severe leucorrhœal discharge in addition, most of the discharge is due to the chronic inflammation of the cervical mucous membrane.

Why, then, are the results of curetting so unsatisfactory in cases of leucorrhœa? To find an answer one must turn to the method generally employed.

The operation of curetting, as generally performed, consists in scraping away the comparatively thick mucous membrane which is very loosely attached to the body of the uterus, and ignoring the thin mucous membrane of the cervix that is very firmly attached to the muscle and in which are deeply embedded the racemose glands, or alternatively if this is curetted, the scraping is of a very perfunctory character. Now, as the seat of the disease is situated in the mucous membrane of the cervix, removing that of the body will do no good at all, and the operation results in a disappointment to everyone concerned. What really needs attention is the diseased mucous membrane of the cervix, and the erosion, if present, and these should be scraped with a sharp spoon and that used vigorously.

The patient having been properly prepared, the

operation itself consists of two parts, dilating the cervical canal and removing the mucous membrane.

Preparation of the Patient.—The patient should be kept in bed for 24 hours before the operation. The evening before the operation, the vulva and the area round the anus should be well shaved. The various parts of the vulva should be made rigid with the thumb and index finger of the left hand, whilst the right hand uses the razor so that they can be more closely shaved. In some cases, in which the patient is very fat, difficulty may be experienced in shaving the vulva efficiently, but this can be overcome by propping the buttocks of the patient on a pillow or by shaving her in the knee-elbow position. After being shaved the patient should have a bath. Unless there is an offensive discharge, the patient should not be douched; but, if this is found necessary, a solution of tincture of iodine, a drachm to a pint of water, the temperature of which should be 105° F., can be used the night before and on the morning of the operation.

On the night before, the patient should be given a dose of castor oil, and on the morning of the operation an enema of two pints of soap and water should be administered. Four hours before the operation the patient may have half a pint of beef tea. She should pass her water naturally just prior to the operation, and should be dressed in a clean nightgown, a flannel dressing-jacket, and have on a pair of long woollen stockings, her hair should be done in a plait and any false teeth removed.

The patient, when anæsthetized, is placed on the operating table in the lithotomy position. Sterilized dressings, etc. should always be used. These articles, in addition to dressings, towels, swabs, and gowns for the operator and his assistants, should include lithotomy leggings and a perineal sheet. The operator

and his assistant should wear sterilized gloves. When the patient is once strapped up in the lithotomy position the nurse should always stand by her side till the operation begins, and the assistant takes her place in case, in the absence of anyone to prevent her, she falls off the table in the trussed position. The vulva and vagina should then be liberally swabbed with tincture of iodine.

Examination of the Patient.—Before inserting the vaginal speculum it is most important that the operator should know exactly the position and mobility of the uterus. This he ascertains by a thorough bimanual examination. The neglect to do so has often failed to disclose some condition, of which perhaps the operator was ignorant, and, moreover, on certain occasions has led to disaster. Suppose, before inserting his dilators, the operator has not troubled to ascertain the position of the uterus and it is displaced backwards. In such circumstances the anterior wall of the uterus has been perforated by the dilator being thrust in the wrong direction. Suppose again the uterus is fixed. In such circumstances in the course of the operation adhesions have been torn leading to intra-peritoneal bleeding or a pyosalpinx has been ruptured leading to peritonitis. The direction of the uterus having been ascertained and, if necessary and permissible, rectified, the vaginal speculum should next be inserted and the cervix disclosed. A volsella should now be attached to the anterior surface of the cervix with which the assistant can steady the uterus, and a second to the posterior surface of the cervix, which the operator will hold in his left hand, and thus be enabled to regulate to some degree the force used when inserting the dilators. Sometimes, especially when the cervical tissue is soft, or when the cervical canal is unduly rigid and will not easily dilate, the volsellæ are apt to tear out,

leaving rather nasty wounds which may bleed somewhat freely. In such cases it will be found useful to stitch a piece of stout silk (No. 6) to each lip of the cervix and use these in place of the volsellæ.

The operator should now pass the uterine sound to confirm the position of the uterus and to estimate the length of its cavity. In the absence of such information the operator, not knowing the length of the uterine cavity, may think he has perforated the uterus if the dilator goes in an abnormal distance, or, alternatively, without realizing how far the dilator has gone, may perforate the uterus; quite frequently, however, the dilators are passed without ascertaining these facts beforehand, which may lead to difficulty, and, moreover, is dangerous.

Dilatation of the Cervix.—There are several points to note in connection with the next step of the operation, which is the dilatation of the cervical canal. Some operators like to make certain the dilator is not being passed too far by "sounding" the top of the uterine cavity. This, which is quite useful when the larger sized dilators are being used, is somewhat dangerous with the smaller, and therefore more sharply pointed, dilators; for in the latter case, if the muscle is soft as it is after a miscarriage, or when malignant disease is present, it may easily be perforated by the point of the dilator. The dilator should be held between the thumb and first two fingers of the right hand, the wrist of the right hand meanwhile resting against the left buttock of the patient. The force employed should never be greater than can be exercised with the right hand in such a position. To place the handle of the dilator in the palm of the right hand, and with the fingers and thumb then to hold it rigidly and "shove" it in, is courting disaster in those cases in which the cervical canal and internal os are very rigid. In such

circumstances the muscle surrounding the internal os may suddenly split, and before the operator can control the instrument, it may have passed into the cavity of the uterus and perforated the wall of that organ. Such a catastrophe has happened many times. When there is any difficulty in inserting the end of the instruments through the internal os the dilatation should be done very slowly, allowing each dilator after it has been inserted to remain *in situ* for an appreciable time, and then, directing the assistant to withdraw it, to slip in the next size at once before the muscle has had time again to contract. It sometimes happens that the point of even the smallest dilator cannot be coaxed through the internal os. In such cases it is dangerous to use any force, and the best thing to do is to slit the cervix on each side up to the level of the vaginal fornix when the internal os will be easily within reach. The lacerations should be sutured with catgut when the operation is completed.

Another very important step is to make certain that the point of each dilator is well beyond the internal os, since if the latter is rigid, it may very well happen that the next dilator that is used will not pass through the internal os as far as the one that had just been removed, and this is particularly likely to occur if, as is the case with the more modern dilators, the instrument is not the same thickness all the way up, but has its diameter gradually decreased to the point. If the operator is not paying particular attention to the length each dilator is passing, he will continue to pass them a shorter and shorter distance, each succeeding instrument only dilating efficiently the cervical canal and not the internal os. Then, when he thinks he has passed a sufficient number of dilators, unless the curette can be pushed through the internal os, he will scrape only the cervical mucous membrane,

whilst the mucous membrane of the body, which was the seat of the disease, is left untouched; or, worse still, realizing that he is meeting with increasing difficulty in getting the end of the dilator to pass well beyond the internal os he begins to use excessive force. In these circumstances it often happens that the muscle-fibres surrounding the internal os being more resistant than those in its immediate neighbourhood, the latter are lacerated. The point of each succeeding dilator, then, instead of passing through the internal os into the cavity of the body of the uterus, catches in the laceration and passes through the wall of the uterus, most commonly into the broad ligament, and more rarely into the cellular tissue between the bladder and the uterus. Such accidents have passed unnoticed at the time, and the cellular tissue has been curetted.

Lastly, there is the danger of lacerating the cervix, It is at times necessary to pass the index finger into the cavity of the body of the uterus, to make a correct diagnosis, in such cases, for instance, as when retained products or malignant disease of the uterus are suspected; moreover, many a doctor has "scored" on making such an examination by finding a small submucous fibroid which was easily enucleable, when some other operator had been satisfied with a smaller dilatation and curetting. It is probable, however, that when the internal os is sufficiently dilated to allow the index finger to pass, some of the muscle fibres surrounding it are torn, and in some cases such a tear may lead to serious bleeding, or may open up the cellular tissue of the broad ligament which, if infection follows, results in pelvic cellulitis, pelvic peritonitis and even, in some cases I have known, death.

If the uterus is perforated in any one of the ways mentioned, the operation should be abandoned, and a douche must on no account be used. As a rule,

if the operation is conducted with strict asepsis, and the uterus itself is not the seat of some septic condition, no harm results.

Scraping away the Mucous Membrane.—As regards the curetting of the uterus, one or two points may be noted. If after dilatation there is a tear in the region of the internal os, which there may be without the operator being aware of the fact, it is practically always on one or other side, generally the left, and if then the curette is passed with its scraping loop looking directly upwards, as is most commonly the case, the end of the instrument may easily catch in the laceration and enlarge it, and in such circumstances the curette has often been pushed into the broad ligament. To obviate such an accident the curette should be passed, with its scraping loop directed either to the left side or to the right of the patient; there is then much less chance of its catching in any laceration should this be present. The body of the uterus should be scraped systematically, first the back, then the front and then the sides, or *vice versâ*. It does not matter which surface is scraped first, but having efficiently scraped one surface there is no sense in repeating this part of the operation. The operator will know when he has scraped sufficiently one particular surface, by feeling, and perhaps hearing, the grating of the curette against the muscle denuded of its mucous membrane. Except in those cases in which the cavity of the uterus is filled with some septic material or the bleeding is excessive, there is no need, to use the flushing curette or to douche the uterine cavity; in fact, if the uterus is perforated with the curette and the flushing pattern is being used, some of the solution may escape into the peritoneal cavity and be the immediate cause of the death of the patient. I have known one such case, and many have been reported. After the

curetting has been completed, the denuded muscle should be dried with a Playfair's probe and on its extraction another soaked in iodized phenol should be inserted for a few moments.

If the operation is to obtain a specimen of the mucous membrane for microscopical examination (early malignant disease, senile endometritis), the operator should particularly warn the nurse not to throw away the specimen removed. Many an operator has found to his dismay that, in the absence of such directions, this has been done.

It is not easy to perforate the uterus with the curette, if the operation is performed intelligently. The old proverb "to be forewarned is to be forearmed" is very appropriately applied to cases of unsuspected malignant disease or to those of retained products. In the first case, there may be just a small patch of early malignant disease into which the curette will sink as easily as it will into a pat of butter. Obviously the perforation cannot be avoided, but if a practitioner has a patient suffering from irregular losses, with no appreciable interval, at or after the menopause, he will be wise to make a digital examination of the uterine cavity before using the curette. As regards curetting in cases of retained products, whatever may be the opinion of a small minority of authorities, the operator will be wise if he follows the practice of the large majority, which is never to curette the uterus in a case of recent miscarriage, for in these cases the wall of the uterus is very soft and often there is sepsis present; he should be satisfied with clearing out as much as he can with his finger. I have known on several occasions curetting in such circumstances to be followed by a spread of the sepsis or perforation of the uterus leading to pelvic cellulitis, pelvic peritonitis, salpingitis, and sterility, and on more than one occasion by death. On the other hand a patient seeking advice

several weeks after a miscarriage, for subinvolution perhaps due to retained products, is well and properly treated by a curetting.

As in the case of the dilatation, if the uterus is perforated by the curette and there is some septic condition present, such as septic retained products, a sloughing fibroid or cancer, or if a flushing curette has been used and some of the solution has escaped into the peritoneal cavity, the patient may die from peritonitis. Exactly what to do in such circumstances requires much experience. If a flushing curette has not been used it is best, if the symptoms are not unduly alarming, to wait and watch, since not infrequently the inflammation remains local. If, however, a flushing curette has been used and the solution is poisonous or if urgent symptoms quickly arise, the abdomen should be opened, the solution, if present, swabbed out, the rent in the uterus sutured, and the peritoneal cavity drained.

Again, during or after curetting there may be an undue amount of bleeding. Eliminating those cases in which the separation of some live portion of retained placenta is followed, not unusually, by rather smart bleeding, which can be controlled by packing the uterus for some hours, there remain those cases in which, owing to a severe laceration of the cervix, the uterine artery or one of its larger branches has been torn or has sloughed later. When the uterine artery has been torn at the time of the operation, the blood may escape into the vagina or into the broad ligament. If into the vagina, there is no mistaking the accident, the bright red spurt arresting the attention of the operator. Sutures, inserted deeply through the lacerated cervix, will usually be sufficient to stop the bleeding. Failing this, however, the bleeding vessel must be exposed and ligatured either from the vagina or *per* abdomen. If the blood escapes into the broad

ligament, a pelvic hæmatoma results, when, if the amount of bleeding is small, apart from the pain, no ill result follows unless, as is sometimes the case, pelvic cellulitis supervenes. If, however, the effusion is great, the blood may strip up the peritoneum and escape into the iliac fossa, or even as high as the loin, when the symptoms and signs of internal bleeding will be manifest, and the operator will have to cut down and secure the bleeding vessel.

Occasionally, and fortunately rarely, some 10 days or so following a laceration of the cervix the uterine artery may slough and very severe bleeding result. Very often it is assumed that the blood is escaping from the cavity of the uterus, and, especially in those cases in which the original operation was performed for retained secundines, the operator concludes that his first operation was not complete, and again curettes the uterus and packs it. I have seen cases such as this in hospital practice and three times in private practice. On the last occasion the uterus had been re-explored twice before I was asked to see the patient, by which time her condition was so desperate that I had to cut down immediately and, having secured the bleeding vessel *per* abdomen and given an intravenous saline transfusion, remove the uterus.

Lastly, intraperitoneal bleeding may result from perforation of the uterus. In such cases it is noticed that, after the patient has recovered from the anæsthetic, she complains of severe abdominal pain and the pulse-rate is unusually fast. If, in addition, the patient is restless and cold and shows other signs of intraperitoneal bleeding, the abdomen must be opened and the perforation sutured, and if these steps are ineffective the body of the uterus must be removed. When the bleeding is not so severe, a pelvic hæmatocele results, the blood collecting in the

pouch of Douglas, which may be absorbed in due course, or, becoming septic, a pelvic abscess results and has to be opened *per vaginam*.

Post-operative Treatment.—There is nothing particular to note in the after-treatment of the patient except that, nowadays, most authorities deem it best not to order a douche unless the discharge becomes offensive. The patient may return to her ordinary diet as soon as she feels inclined; the bowels should be kept regular, and she may get up in a week, except in the case of subinvolution, when it is better to let the patient rest a few days longer and to put her on to an ergot mixture.

THE OBSTETRIC FORCEPS.

The obstetric forceps is even a more dangerous instrument than the uterine curette; it is more frequently employed, and, apart from the danger to the mother, it is a severe menace to the child. Now, there are certain circumstances in which the obstetric forceps must be used, danger or no danger. I refer to those conditions in which it is necessary to deliver the child quickly.

In those cases of antepartum hæmorrhage in which the head is presenting, the membranes are ruptured and the os is fully dilated, and in the case of unavoidable hæmorrhage, when in addition the placenta is not overlapping the os, labour should be terminated. In certain cases of cardiac disease, when the right side of the heart is overdistended, and the patient is distressed by the uterine contractions and her bearing-down efforts, sudden death has been known to occur. In such cases, as soon as the size of the os will allow, labour should be terminated. The same procedure is correct in cases of advanced pulmonary disease and eclampsia at the beginning of the second stage of labour. When fœtal distress is due to prolonged

labour following early rupture of the membranes, or when the umbilical cord is prolapsed or expressed, and the life of the child may be in imminent danger, it is right, if there is no contra-indication such as a contracted pelvis, to hasten its delivery with the aid of the forceps.

The remaining indications, namely, when there is some malposition of the fœtal head, when the uterine pains are not strong enough to expel the child, and when there is a slight disproportion between the pelvis of the mother and the head of the fœtus, require careful consideration.

Antenatal Supervision.—It is hardly an exaggeration to say that, with adequate antenatal supervision, such indications for the use of the obstetric forceps as malposition of the head of the fœtus and disproportion between the mother and child should never arise. It is obvious that a careful examination of the mother at repeated intervals during pregnancy should disclose at some time or other the fact that the head of her child is not in its normal position, or that her pelvis is smaller than normal, or that the disproportion between the head of the child and the pelvis of the mother (due, in the absence of pelvic contraction, to the size of the head of the child) is such that, in a primigravida the head has not entered the pelvis, and in a multipara, cannot be pressed into the pelvis during the last two or three weeks of pregnancy. With such information, in the majority of cases, difficulty during labour can be prevented. Nowadays, in general hospitals with maternity beds or in the maternity hospitals, the antenatal departments are very efficiently run, and it is the experience of all officers in charge that the percentage of difficult labours and other serious complications has been remarkably reduced since the antenatal departments were set up. Apart from the hospitals, moreover, there are in most large

towns antenatal clinics, and poorer patients, even when they are to be attended by their own doctors in their own homes, are encouraged to attend these clinics. Those who have their own medical attendants and can pay for adequate supervision, should be examined from time to time during their pregnancy, and especially during the last month.

Cases seen for the first time during Labour.—The routine is such, in well organized hospitals, that directly a patient is admitted in labour she is examined very thoroughly, and her condition is noted on the case paper. Such complications, therefore, as early rupture of the membranes, some malpresentation, a contracted pelvis, the fœtal head being movable above the brim, etc., are at once detected and efficiently treated. This means that if there is any abnormality, and the lives of the mother and child are not jeopardized the unwarranted use of the forceps is prevented. It is an unfortunate fact that many practitioners fail to make a complete examination of their patient in the early stages of labour, and are content to let it proceed until something appears to go wrong when a recourse to the forceps may end in disaster to the mother or child, or at any rate to some serious injury to the mother from the effects of which she may suffer for years.

Incentive to hurry Delivery.—There is no incentive to the hospital officer to hurry delivery, whilst in many cases there is every incentive to the private doctor. The result is that the latter, even if he is well educated and conscientious, is at times sorely tempted to put on the forceps in cases in which they are distinctly contra-indicated, and if he is not well educated or not conscientious he will certainly not hesitate to do so. Such contra-indications are when the os is not fully dilated, and when there is a disproportion between the head of the child and pelvis

of the mother which is not obviously insuperable, and which would surely be overcome if only sufficient time was allowed for the head to mould. Such unwarranted use of the forceps is responsible for a large amount of misery to many women and every now and again is the direct cause of their deaths or that of their children.

Now a few words concerning the circumstances in which the forceps are most usually employed.

Malposition of the Head of the Child.—The most severe ruptures of the pelvic floor are due to the use of the forceps as a first treatment in occipito-posterior presentations. In a certain number of the third and fourth vertex presentations, the occiput, instead of rotating forwards, rotates backwards. A third or fourth vertex can easily be diagnosed at the commencement of labour or at the commencement of the second stage. With the knowledge, therefore, that the occiput has started behind, if labour is prolonged, the medical attendant should realize that this is due to the occiput not rotating forward. It is then quite easy, the patient being anæsthetized, to pass one hand into the vagina and taking hold of the head to rotate the occiput forwards, the anterior shoulder being likewise rotated to the front by the other hand on the abdomen. But even if the doctor does not see the patient till the second stage of labour has been on for some time and the strongly contracting uterus prevents efficient abdominal examination, whilst the large caput succedaneum masks the anterior fontanelle and sutures, he can still pass his hand up by the side of the head and feel which way the pinna of an ear is pointing and if backwards rotate the head.

What, however, in a large number of cases really happens? With the presence of strong uterine pains, with the head low down and with no obvious contraction of the pelvis, the doctor applies the forceps

and pulls. More often than not the blades slip, and it is probably only after one or two ineffective trials, owing to the slipping of the forceps, that he is led to make a careful examination and discovers that the case is one of unreduced occipito-posterior. In some cases the perineum is torn through to the rectum by the slipping forceps even before the head is delivered. If, however, his efforts to extract the child are successful, the perineum is torn often through into the rectum and the pelvic floor much damaged because the occipito-frontal diameter of four and a half inches is dragged through the vulval orifice, whereas, if the patient had been properly treated, Nature could have pushed the sub-occipito-frontal or bregmatic diameter of three and three-quarter inches through this orifice. The result to the patient is that she requires an immediate operation, which may be unsuccessful, or a recto-vaginal fistula not infrequently develops; and very probably some operation later on for this or for prolapse of the uterus, is required. If, however, the doctor diagnoses the malposition and the head cannot be rotated and the child is alive, the forceps must be used. The axis-traction forceps are the best, since their movable handles will allow the occiput to rotate forward during delivery, an event which occasionally happens.

The same remarks apply to an unreduced mento-posterior presentation, only more so, because in this case the use of the forceps will nearly certainly lead to the death of the child. If, however, the chin is anterior and there is undue delay, in the absence of any contra-indication, the forceps may usefully be employed. In brow presentations no time should be wasted in trying to effect delivery by the forceps, and in cases in which the uterus is in a state of tonic contraction, their use is positively contra-indicated. In breech presentation, if the after-coming

head is delayed by extension, and delivery by the Prague method or by jaw and shoulder traction has failed, and the child is alive, the forceps are indicated.

Disproportion between the Head of the Child and the Pelvis of the Mother.—Labour may be delayed in these cases because the pelvis of the mother is smaller than normal, the head of the child is larger than normal, or because, owing to some malposition, the diameter of the head endeavouring to enter the pelvis is larger than normal, as, for instance, when the occiput lies behind. Malpresentation and its treatment has already been dealt with, so that cases in which the disproportion is due to size need only be considered.

Unless the difference from the normal in the external measurements is decided, their estimation is not of much value as an indication of the best treatment to pursue, and in the minor degrees of a flattened pelvis and in a generally contracted pelvis it is not an easy matter to touch the promontory of the sacrum unless the patient is under an anæsthetic. Absolute measurements of the pelvis, therefore, although in certain circumstances they may have their value, are not to be compared in importance with the relative measurements of the head and pelvis. In scientific midwifery the determination of the best time for induction of labour in cases of disproportion is no longer a matter of arithmetic, having as factors the size of the pelvis and the duration of pregnancy, but of close antenatal supervision. As a working rule it is not worth while inducing labour before the thirty-fourth week of pregnancy so far as the child is concerned, because statistics show that even if it survives its birth it will in all probability die some time during the first year of its existence. Every pregnant woman, therefore, should be examined at the thirty-fourth week at the latest in order to discover the relative size of the head and pelvis. If

at this time in a primigravida the head has not sunk into the pelvis or cannot be pushed into the pelvis, except with difficulty, the medical attendant will know that labour should be induced. If the head is above the brim but can be pushed into it easily, a further examination should be made at the thirty-sixth week. In a multipara, although the head does not sink into the pelvis till labour has commenced, there is the history of former labours and the relative size of the head and pelvis in the present pregnancy to guide the practitioner.

With adequate antenatal supervision the practitioner can, in the large majority of cases, anticipate the use of the obstetric forceps for disproportion. Unfortunately, every pregnant woman does not receive this supervision, which may not be due to any omission on the part of the doctor who attends her in labour, since he may have been called in for the first time when labour has been delayed. No woman with a contracted pelvis should be delivered by the forceps in whom, if the pains had been strong enough, the head could have been moulded and pushed through the pelvis. It may be taken, therefore, as a maxim that if, in the presence of strong uterine pains and a normal presentation, allowing plenty of time, the child is not born before the condition of the mother warrants interference by her doctor, then the case is not suitable for delivery by the forceps. It is a fact, however, that in many cases of disproportion, especially of the minor degrees, the uterine contractions are not as efficient as they should be, and it is in these cases more particularly that the medical practitioner so often uses the forceps with disastrous results. The following question presents itself, therefore. When in cases of disproportion, the uterine contractions not being efficient, is the medical practitioner justified in using the forceps? To answer this one has to consider the position of the head of the

child.

Delayed above the brim.—If, labour having started, the head of the child is movable above the brim of the pelvis of the mother, the forceps are absolutely contra-indicated and the case is one for Cæsarean section or perforation. If the forceps are used, the mother may be gravely injured and the child will almost certainly be killed.

In the brim.—If the head is delayed in the brim, a very careful examination should be made of the relative size of the head and the pelvis. If there is no malpresentation, if there is no definite degree of pelvic contraction, and if the bi-parietal diameter has passed, or is passing, through the brim, it is certain that, if sufficient time is allowed for moulding, the head in the majority of cases can be pushed through by Nature. If the pelvis is obviously contracted, the treatment will depend on the variety of contraction. Thus, in a flattened pelvis, if the head is lying transversely, with its sagittal suture nearer the promontory of the sacrum than the symphysis pubis and its anterior fontanelle is within reach, sufficient time should be given for moulding, and, if necessary, the forceps can then be used. If, however, the sagittal suture is nearer the symphysis pubis, the child may be delivered by version, if the head can be pushed up and there is no tonic contraction of the uterus, or it should be perforated. If, on the other hand, the pelvis is generally contracted, unless the head is well flexed the child should be delivered by perforation. If the head is well flexed, gentle traction with the forceps, the patient being in Walcher's position, may be tried. In either case, if the child is dead, no trial should be made with the forceps, but its head should be perforated.

Below the brim.—In cases of disproportion the forceps is most often used when the head has passed

the brim and is delayed in the pelvic cavity. In these cases the head does not recede in the interval of the pains, and the caput succedaneum becomes abnormally large. If, by the time the practitioner sees the case, the vagina is hot and dry, and the vulva is œdematous, or the child is dead, delivery should be effected by perforation. Otherwise, an attempt at delivery may be made with the forceps if gentle traction be used.

Inefficient Uterine Contractions.—In the great majority of cases in which the forceps are used, it is because there is an unusual delay in the birth of the child. Now, as the forceps should only be used if it is certain that Nature would herself deliver the child if the uterine contractions were strong enough, it results that when the forceps are used legitimately they are in most cases employed for the condition known as the "sluggish uterus." In such a condition the forceps not only may be used, but should be used, since the patient will be saved a certain amount of pain, worry and distress without appreciably increasing the danger to herself or child, and, which is more important, by an intelligent use of the instrument it is possible to anticipate the supervention of uterine exhaustion with all its unpleasant consequences.

One astounding thing is, that there are a large number of practitioners who, whilst taking meticulous care in preparing a patient and her surroundings for any other surgical operation, are quite careless of such things when they come to deliver a woman with the forceps. Many men are still satisfied with placing the blades only in hot water or a weak solution of some chemical antiseptic. The forceps should always be boiled. There are some doctors who would not dream of performing the operation of curetting unless the vulva of the patient had been

shaved, and yet they never deem it essential to prepare the patient in the same way before delivering her with the forceps, although, in the circumstances, the latter operation, as regards the risk of sepsis, is much greater. The vulva should always be shaved.

Before the doctor applies the forceps he should, for obvious reasons, if there is time and the lower bowel has not previously been emptied, as it should have been at the beginning of labour, direct the nurse to give an enema. The bladder should be emptied by a catheter even if the patient has passed water recently, since there is a distinct danger of injuring the bladder during forceps extraction if it contains much urine.

Every patient should be provided with a sterilized outfit, and if she cannot afford to buy one, and cannot go into hospital, it should be supplied by the Public Health Authority. Failing this, at any rate, clean sheets and clean towels should be used, and the doctor should have on a clean apron. Sterilized india-rubber gloves should certainly be worn, and yet the majority of practitioners do not wear such gloves when attending a midwifery case, although they have got as much, if not more, reason to do so. The chances of infection are greater and the results, if this supervenes, are, as a rule, much more serious.

The patient should be fully anæsthetized or not at all. To use the forceps with the patient "half under" is a most dangerous procedure, since she may, in her struggles, seriously injure herself. It is quite obvious that a doctor attending a private midwifery case cannot always have at his beck and call a colleague to give the anæsthetic, but there is nothing, except the outlay of a few shillings, to prevent his using a Junker's inhaler, which, after he has fully anæsthetized the patient, he can hand over with safety to the nurse,

or, in the absence of an intelligent one, can use himself by having the bulb, wrapped in a sterile or clean towel, in the neighbourhood of the buttocks.

The presentation should always be re-examined just before the forceps are applied to ascertain whether it has changed. It happens sometimes, for instance, in the case of an unreduced-occipito-posterior position, in which rotation with the hand has failed, to find that, by the time all the preparations have been made for delivery, the occiput has rotated forwards.

It is an aphorism that the forceps should never be used until the os is fully dilated, except in rare cases, and then only when the os has been dilated sufficiently with the gloved fingers. There are men, however, who do not hesitate to deliver with the forceps before the os is fully dilated because they are in a hurry, relying on the forceps to do this for them. Now such a procedure is most reprehensible and full of danger. Not a few times I have known, in such circumstances, the cervix torn right into the broad ligament, with a resulting hæmatoma, on occasions followed by suppuration, and twice I have known a patient bleed to death from rupture of the uterine artery. Fortunately, when the forceps are thus employed, the softened cervix often allows itself to be stretched with a less serious laceration, but the danger does not rest here. By the time the os has been sufficiently dilated by the blades of the forceps to allow the head to pass, the cervix has been dragged down so low that its attachments, and especially the lateral cervical ligaments, are unduly stretched, the pelvic floor is severely damaged and the woman later on suffers from prolapse. I know of a case in which the presentation was a vertex, and the pelvis and head of normal size, admitted to hospital because delivery by the forceps had failed. The cervix was only partly dilated and the head of the child had escaped into the peritoneal cavity

through a laceration in the lower uterine segment, caused by the slipping of the forceps.

The force used in extracting the head of the child and the rapidity with which it is extracted, is often quite unwarrantable. Doctors will at times tell one, with evident pride, how they managed to deliver a child after a pull which necessitated the employment of all the force they could muster with their arms, aided by the counter-pressure of a foot against the bedstead "and I can tell you it made me sweat." That the child was dead on delivery, or died soon after, from intra-cranial hæmorrhage, did not appear to surprise them. The force exerted should not be greater than that which can be applied with the forearms, and the traction should be slow and with the pains, the blades of the forceps being loosened in the intervals by leaving go of the handles, or if using axis-traction forceps, by loosening the screw.

Lastly, it is hardly necessary to remind the practitioner that the membranes should be ruptured, and that the blades of the forceps should be inside the uterus if the head has not passed through the os, and that they should be in contact with the head of the child. And yet I know of two cases in which the blades of the forceps were forced into the broad-ligament, the lower uterine segment grasped where it was in contact with the head, and by strong traction torn completely off the upper uterine segment.

Truly, the operations of curetting women and extracting children with the midwifery forceps are responsible for more misery and morbidity to women and more deaths to children than any other.

Sports Injuries.

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OF late years there has arisen a tendency to group certain injuries according to the sport which has given rise to the lesion, much as certain conditions receive their nomenclature from the occupation or work in which they are most commonly encountered. Thus nowadays we speak of "tennis calf," or "golf elbow," and other sport injuries, just as "housemaid's knee" or "miner's elbow" is employed to describe a bursitis in these situations.

Before dealing specifically with the varied injuries which have become so associated with definite games as to take their name, it is well to bear in mind certain precepts when dealing with all athletic injuries. The patients for the most part are young and healthy, and since these conditions are purely traumatic, the question of constitution need not often be considered. In the first place, the "do nothing but rest and quiet" is to be avoided, and every attempt should be made to get the patient sound quickly. The pain in ordinary cases of sprain or traumatic synovitis, once the initial pain of reception has passed off, is due to the pressure caused by the exudation on the sensory nerves. The best method of reducing this swelling is by light massage, intelligently applied. Until the services of a skilled masseur can be obtained, the pain can be relieved either by heat in the form of hot fomentations, which by dilating the capillaries relieves tension, or in the early stages by acute cold, which by contracting the blood-vessels prevents

further exudation. After absorption of the swelling the acuteness of the pain will abate, but pain on use will be present owing to the movement of the damaged tissue. Support of the injured limb by means of a bandage, or still better by intelligently applied adhesive plaster, will enable the patient to get about in gradually increasing comfort. An important point to bear in mind is that an injured joint always means muscle-wastage from reflex action; therefore, after prolonged disability this wastage must be restored by means of electric stimulation or graduated exercises by means of weights and pulleys.

In any case of doubt, the radiograph should be employed for information, and incidentally self-protection, and there should never be such self-confidence as to resent the suggestion of a further opinion. It should be borne in mind that there is no standard of pain, and that what may be discomfort in one individual is agony in another. Each case should be considered on its merits, and the idiosyncrasies of the patient in the respect of pain should not bias the judgement. A sprained joint or a fractured bone remain the same, whether the patient complains of or ignores the inevitable discomfort.

Tennis or Golf Elbow.—The great popularity of lawn-tennis and golf has drawn attention to an inflammatory condition of the muscles round the elbow-joint from which these players are very liable to suffer. Other causes for a similar condition are fly-fishing, weeding, fencing and the use of a heavy coaching whip. The onset is rarely sudden, but is characterized by the pain round one of the condyles of the humerus, gradually increasing in severity until any attempt to indulge in the particular game is attended by so much discomfort as to render the forearm practically useless. Experience has led me to believe that there are three distinct stages or types which

may exist either separately or in combination. The most common variety is when a condition analogous to tenosynovitis is set up in the muscles round the elbow-joint. These muscles, lacking a tendon and investing sheath, become affected with a traumatic fibrositis, which is occasioned by the repeated jerks of the muscles at their origin.

The external condyle, with its muscular attachments, is the most usual situation of what may be termed the first condition, or stage, whilst the muscles mostly at fault would appear to be the supinator longus, and extensor communis, which become affected from such actions as back-handed play at tennis. I believe the universal use of a large-handled racket in lawn-tennis, without consideration of the size of the player's hand, has much to do with this common ailment. The strain on the muscles by playing with too large a handle is as productive of overstrained muscles as playing with too heavy a racket. When the pain is experienced on the inner condyle and the corresponding muscles, approach shots at golf, or playing with a cut at tennis are actions likely to cause the trouble. The faulty muscles will be found to be cramped, indurated and painful on pressure.

The second type may also exist, and here the tender spot is often found on the condyle itself, corresponding to some portion of the origin of the affected muscle whose action is painful and is suggestive of a localized periostitis. The third type may be met with either alone or in conjunction with the other two. It is when a simple arthritis is set up in the radio-ulnar joint which may eventually undergo bony change. Practically in every type, with occasional exception in the first, the onset of tennis or golf elbow is always gradual. In the simple muscular type pain can usually be elicited by pressure over the affected area, but otherwise it is only noticed by such movement

as calls into action the muscles at fault. Patients thus affected can lift or pull heavy weights from the ground with perfect comfort, while any small action such as pouring out tea, tying a bow tie, brushing their teeth or similar movements are exquisitely painful.

In such conditions treatment is usually successful, and consists in intelligent massage of the affected muscle group, in order to supple down the fibrotic condition. Such massage should be confined entirely to these affected muscles. Massage of the whole arm and shoulder in such a condition is quite unnecessary, unless it should be found that the muscles in such situations are also affected. During the course of massage, which ought to be daily for an average period of ten days, it is advisable for the patient to abstain from playing those games which caused the trouble. The full effects of the massage may not be appreciated by the patient until some days have elapsed. The muscles having been suppled down by massage, the forearm ought to be strapped, with the double object of supporting the muscle, and at the same time checking the pull on the condyle.

The most satisfactory way of doing this is to cut two strips of adhesive plaster about one inch and a quarter in width. The first is applied so as to encircle the forearm at the juncture of the upper and middle third. The second piece is folded on itself, and a semi-circle cut from it. This is attached so as to overlap the first by a small margin, whilst the opening made by the removal of the semi-circle enables the support to cover the forearm completely up to the joint without interfering with flexion. When putting the plaster on see that the elbow is semi-flexed, and supinated with the muscles of the forearm relaxed. With the strapping properly attached, play can once

more be resumed, and though a certain amount of discomfort may be experienced, the condition will not be aggravated but will gradually clear up. In the second variety a small swelling is often to be detected in the early stages, and should massage and radiant heat fail to cause improvement, counter irritation or administration of iodine by ionization will sometimes be found useful.

When the radio-ulnar articulation is affected, swelling and pain over the head of the radius will be found. Massage combined with radiant heat often give excellent results, if the patient taking his trouble in time seeks early advice, but in this condition, especially if arthritic changes are beginning, recovery seems very slow, and ionization appears to hold out the best prospects. In the two latter varieties extension from the exciting causes should be greatly prolonged.

Rider's Strain.—This title is given to the injury which is very common during the hunting season. When riding it may be occasioned by the sudden swerve of the horse when jumping or galloping, but any action causing overstrain of the adductor muscles will occasion this condition. The lesion may extend from a slight sprain to almost complete rupture of any of the adductors. The adductor longus is the most usual muscle to be affected, but the whole group are more or less involved. The injury may take place at the attachment of the muscles to the pelvis, the belly of the muscle itself may be partly torn. The pain experienced is described as sickening in character, and though the patient is able to sit his horse, any attempt to grip the saddle with his knees will be rendered abortive from the pain produced. The thigh on the inner side will be found to be swollen and very painful to the touch, while careful examination will often reveal a small groove in the damaged

muscle. Ecchymosis is often excessive, and in severe cases will extend down the whole length of the thigh.

Too often this condition is treated by palliative lotions and rest, the latter being of an extended character. Eventually riding is permitted, the patient wearing some supporting apparatus, and although soundness to a certain extent is obtained, yet a large number of cases show a tendency to recur month after month, and season after season. The most satisfactory method of dealing with these injuries is by skilful massage, which should be directed to obtaining absorption of the extravasated blood and lymph. The length of time required to obtain this will vary according to the severity of the injury, but even in severe cases daily massage, if properly applied, will rarely be necessary after a week or ten days. In the intervals of massage ordinary walking is to be advised, but care should be taken to avoid any movement likely to cause sudden abduction of the injured thigh, such as might occur by getting out of a moving vehicle.

The swelling having practically subsided by means of the massage, the thigh should be strapped by means of adhesive plaster. This will not only give support to the injured muscles, but will assist in the absorption of any remaining effusion. Three strips of any non-irritating adhesive plaster are cut of sufficient length to encompass the thigh, and about two inches in breadth, and applied from below upwards, each succeeding piece overlapping its predecessor by about half an inch. Care should be taken that the last strip is shaped so that it fits well into the fork, but does not chafe the fold of the buttock. Riding may now be tried, but it is wiser at first to limit this to quiet hacking. In the course of four or five days the strapping must be renewed, while jumping can now be permitted, but as an

added precaution against undue strain the stirrup-leathers should be shortened by one or two holes. The strapping should be renewed from time to time until all pain during or after hunting has disappeared. In the later stages a Salmon riding belt can be substituted for the adhesive plaster.

Chronic Rider's Strain, by which is meant a strain that recurs year after year, requires a slightly different form of treatment. Such cases always show atrophy of the muscles of the thigh in general, and contraction of the adductors in particular. This is occasionally so pronounced that the muscles may need stretching under an anæsthetic before treatment can be successful. In less severe cases soundness will be established by overcoming the contraction of the adductors by firm massage, and by restoring the strength to the wasted muscles by means of suitable exercises. When a condition of intense rigidity is found in the adductors, a radiograph should be obtained, in order to eliminate that curious anomaly, rider's bone (Myositis ossificans). In running, especially at the start of a race, people are apt to sustain a partial rupture of the hamstring muscles of the thigh, and treatment similar to that described for rider's strain gives excellent results.

Lawn-tennis Calf.—The onset of this injury is very characteristic, and the patient usually imagines he has been sharply struck by a stone or a stick, causing exquisite pain in the leg. This pain is due to the sudden rupture of some fibres in the muscular structure of the calf. Swelling follows rapidly, and the subsequent ecchymosis is often considerable. The situation of the lesion, judged from the pain produced by examination of the leg, varies considerably, and occasionally a distinct sulcus can be detected when the injury is situated in the gastrocnemius. Dr. Wharton Hood originally described this injury, and detailed the

treatment he adopted; amongst the cases quoted being that of the celebrated cricketer, Dr. W. G. Grace, who consequently had been enabled to continue his innings at Lords with conspicuous success. The treatment briefly consists in supporting the calf muscles by means of strips of adhesive plaster of sufficient length to encircle the leg, and about one and a quarter inches in width. Starting just above the ankle joint, care must be taken that the plaster lies flat and free of creases, each succeeding piece slightly overlapping the former. The strapping is carried above the belly of the gastrocnemius up to just below the knee. Each strip should start from behind forwards, so that the ends fold over the front of the shin, till the whole looks like a well-fitting puttee. Care should be taken that the folds are level and do not sag at the back, for this is liable to cause chafing. Immediate use of the limb is essential to rapidity of cure, and before dismissing your patient see that he walks with weight on the foot, with toe-and-heel action, even at the expense of considerable pain. It should be borne in mind that, with the leg thus strapped, the pain is rarely severe, and gradually subsides. The pain, in fact, is disagreeable to the patient but harmless to the leg. The plaster should be renewed at the end of the third day, and subsequently at increasing intervals as the swelling subsides. The simplest method of removing the plaster is to insert a blunt-pointed bistoury, and cut straight up, when the plaster can be removed *en masse* with a minimum amount of discomfort to the patient. Complete recovery can be anticipated within three weeks, during which time the patient will not have been required to abstain from attending to the ordinary duties of life. It sometimes occurs that the tendo Achilles is partly ruptured by some action similar to that which produced the tennis calf. Should this occur, the question of suturing by open operation may

be discussed, but by strapping the ankle-joint and continuing the plaster up the leg as in lawn-tennis calf, these cases will often make an uneventful recovery, without rest in bed and the attendant discomfort of an operation.

Cricket Injuries. — Among the injuries to the shoulder which may be met with in conjunction with games is when acute pain is experienced in front of the joint by cricketers when bowling or throwing, and is due to a sprain of the long head of the biceps. On examination, the tendon sheath will often be found thickened, and that a condition of tenosynovitis has arisen. Treatment consists in radiant heat when possible, and light massage, which should be confined to the affected area, general massage of the arm, fingers, and side of the neck being totally unnecessary. The inflammation, if neglected, is very liable to spread along the course of the tendon into the joint itself, and is a frequent source for the causation of subsequent adhesions in the shoulder. Though anything like undue briskness or violence must be avoided in the massage of these cases, even in the early stages slow voluntary movement of the arm should be encouraged. The pain in these cases is sometimes very intense, especially when the condition has been suddenly sustained by some violent wrench, and occasionally an acute synovitis of the whole joint is found. Heat, either radiant or by the application of fomentations, together with light massage, is to be recommended.

When the arm is taken into use once more, it is as well to support the joint in the following method. A strip of adhesive plaster of sufficient length to encircle the shoulder-joint, is folded on itself and shaped to fit the axilla. With the arm raised to a right angle, a pad of cotton wool is placed in the axilla with a view to avoiding the plaster causing chafing, and the plaster is brought firmly round the joint. This gives a sensation

of comfort and support which enables the patient to take the arm into ordinary use with gradually increasing confidence and freedom from pain. Inflammation of the sub-deltoid bursa is not uncommon amongst athletes, and is often occasioned by falls. Radiant heat and massage in the early stages will relieve this condition; but when the patient has ignored his ailment, a chronic bursitis will seriously interfere with the action of the joint, and may need a somewhat vigorous treatment to overcome.

Cricket is also responsible for the production of an injury that has received the cognomen of *Dropped top*, the condition which, I believe, in America receives the title *Baseball finger*. It arises from a sudden blow on the tip of the outstretched finger, which causes a sudden flexion of the joint when the extensor tendon, being unable to relax in time, is split, or partly torn, at the attachment to the terminal phalanx. Pain and bruising are the obvious results, and though the terminal phalanx can be extended readily enough by passive movement, it at once drops into the semi-flexed position on the pressure being removed. When the lesion is so severe that the general utility of the finger is likely to be impaired, the question of open operation may be considered. Rest on a splint in the extended position is sometimes advised, but complete recovery is doubtful as regards complete voluntary extension.

The method of treatment that appears to answer satisfactorily is massage of the injured joint. This massage, when once the acuteness of the injury has subsided, can well be carried on by the patient himself. Great perseverance will be needed, for, in spite of the fact that the joint and finger are quite painless, considerable induration and thickening remain, so much so that until a radiograph proves the contrary, some injury to bone might be suspected. Though a perfectly

useful finger is obtained, full extension of the termina phalanx rarely results.

Cricket is also responsible for a sprain or tear of some fibres of the oblique muscles in the abdomen. This is caused by bowling, especially on a greasy wicket, where the bowler's foot is apt to slip. The onset can be gradual in the case of overstrain, or sudden in the case of some tear in the muscular structure. The treatment consists in bearing out the aphorism of the late Dr. Wharton Hood: "Rub and strap." Massage to the affected muscles should be continued till tenderness on pressure or pain on ordinary movements have subsided. The flank should now be strapped in the same way that is adopted for fractured ribs. When applying the strapping, the patient must lean well over towards the affected side, so that on resuming the erect posture the plaster tightens. The plaster should be carried from the vertebral line round the body to an inch or more over the medial line of the belly.

Football and practically all games are responsible for *injury to the knee-joint*, sprained knee and the attendant acute synovitis being only too common. It is too often assumed that these cases of sprained knee are due to the displacement of a semi-lunar cartilage. Sir Arbuthnot Lane some years ago demonstrated that split semi-lunar cartilages were readily produced by violent blows on the joint. Some cases of acute synovitis of the knee-joint are due to displacement of the semi-lunar, yet this injury is not so common as is apparently believed. Great care should be taken in finding out whether there has been a history of definite locking of the joint before arriving at a conclusion that a genuine displacement of the cartilage has been sustained.

In this paper it is assumed that the case is one of sprain of the joint, followed by acute synovitis, and not one of internal derangement of the knee-joint.

When the joint is full and tense it is occasionally advisable to aspirate the joint before continuing treatment. Since the most comfortable position for a full knee is that of semi-flexion, the custom of fixing the knee to a flat back splint is both painful and unnecessary. Rest in bed, with the knee supported by a pillow, is all that is required, and light massage at once begun for the purpose of obtaining absorption of the extravasated fluid. In addition, evaporating lotions or an ice-bag can be applied to the joint, whilst the use of anti-phlogistin will often give relief to the pain. As the fluid subsides, which it should within the course of a few days, the knee-joint will automatically resume the extended position on the pillow, and during the massage the patient should be encouraged to move it into gradually increasing flexion. When all the effusion has subsided, the patient should be encouraged to move about, the joint meanwhile being supported by either a firm bandage or, still better, by strapping, which, by placing a small layer of cotton wool over the patella, and in the popliteal space, will enable the patient to flex and extend the knee in walking. Before the patient is allowed to discard this artificial support or resume his athletic life, the muscular condition of the thigh must be carefully examined. Practically every case will show muscular wastage, which, in conjunction with the fact that the ligaments of the knee-joint have been stretched and sodden by synovial fluid, will require bracing up before soundness can be considered complete. This can be done either by electrical stimulation or graduated exercises by means of weights and pulleys, which throw no strain on the joint. Many cases of recurrent synovitis of the knee-joint are entirely due to the want of the natural support afforded by the muscles of the thigh.

Amongst the young below the age of seventeen,

a somewhat curious condition, called *Schlatter's disease*, may be met with. Pain is complained of in the front of the knee-joint over the head of the tibia. This is due to the pull of the patella tendon causing a starting of the epiphysis of the tubercle from the tibia. There is sometimes swelling, and pressure over the tubercle causes considerable pain. When rest and abstention from games prove useless, cure can be effected by open operation, and driving back the rising tubercle into place, by a few sharp blows.

Acute *tenosynovitis of the tendo Achilles* is often set up through the habit of tying the lace of the boot too tightly round the ankle. The repeated "beat" of the tendon against this constriction during a long walk, or a day's shooting, causes swelling in the tendon sheath and great pain. When neglected, this condition is difficult to repair. Radiant heat and massage and abstention from the wearing of boots usually suffices, but where, as in the Army, the use of shoes for marching was forbidden, many cases were seen in which the condition had become chronic, and considerable difficulty experienced in obtaining soundness.

An injury that is common to all forms of sport is that of a *sprained ankle*. The method of treatment which is undoubtedly the most satisfactory, is that of supporting the joint by strapping, and use. In order to strap the ankle, four pieces of adhesive plaster about twelve inches long, and one and a quarter inches in width, should be cut. The first strip is placed from below upwards round the ankle joint. The second starts behind, crossing in front of the joint, over the instep. The third piece is folded on itself, and a small piece can be cut out. This strip of plaster starts from behind, as in the second, but lower down, and is brought forward below the malleoli, the small nick which has been cut out

of the plaster, being for the purpose of avoiding chafing the heel. The fourth piece is wrapped round, just above the ankle. A sprain of a joint being an incomplete dislocation, the tendons and ligaments are overstretched and possibly torn. The repeated tightening and loosening of the plaster in the action of walking carries out the effect of massage, whilst the support afforded by the plaster enables the patient to move about freely, and without danger. No case of uncomplicated sprain of this joint needs rest in bed. If the object of the patient is to obtain a speedy cure, he must use the ankle, and be encouraged to walk, once it has been strapped as above described, and pain will be found not so severe as is apprehended. The plaster should be renewed at the end of the third day, when it will be found to be loose, owing to subsidence of the swelling. The bruising will be noted as appearing down the toes, and round the foot, below the level of the plaster, whilst the surface of the skin covered by the plaster will be comparatively free. Strapping should be replaced in about a week's time, and then from time to time till soundness is established. When the case is not seen for some days since the injury was received, though strapping will eventually obtain a good result, it is preferable to start the absorption of the extravasated blood by means of massage. After three or four days the massage can be stopped, and the joint strapped and taken into use.

Antiseptics in Common Operations.

By W. E. DIXON, M.D., D.P.H., F.R.S.

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THE cells of bacteria, like other cells, are composed of colloids, principally proteins and lipoids, in a state of hydration, which resemble fats in their solubilities. This colloidal mass with ferments, water, and salts, forms the protoplasm; the salt concentration is not constant, but varies considerably in different micro-organisms. Protoplasm is easily injured by conditions which affect the colloids, so that substances which are able to penetrate the cell are those most likely to prove injurious. The protoplasm of bacteria is not, so far as is known, intrinsically different from that of other cells, and it might be expected that penetrating substances would affect micro-organisms in the same way that they affect other tissues. But bacteria appear also to have the property of attracting to themselves certain substances either by physical processes, that is in the same way that charcoal filters out by adsorption the colouring matter from vegetable infusions, or, as Erhlich supposed, by an anchoring group which can attach itself to particular drugs. Dyes, for example, by adsorption or anchoring, are so attracted, and since these substances readily penetrate, they may kill the micro-organisms without much injury to the surrounding tissues. The ideal antiseptic should, therefore, be

one which will destroy all micro-organisms in its sphere of action without injuring the body-tissues, and the usual method of testing injury of tissue is by observation of the leucocytes in the wound; these cells are easily affected by poisons, and are certainly the cells which are easiest to examine. Observations of this nature have shown that antiseptics like perchloride of mercury (1 in 1,000) or carbolic acid (1 in 20) destroy some leucocytes, but the significance of this is not great, since the proportion of micro-organisms destroyed is probably out of all proportion to the injurious effect on the tissues. With some antiseptics like the hypochlorites, and certain dyes, the injurious effect on leucocytes is almost negligible.

The mineral acids and heavy metals do not destroy bacteria by direct penetration of the cell or by dissolving the lipoids, but by combination with proteins and destruction of the cell envelope. Spores are protected much more effectually than bacteria; concentrated solutions of salts, distilled water or alcohol, all readily kill bacteria, but do not kill spores even after a week's immersion. Moreover, spores are not protected by a lipoid membrane, since lipoid-soluble antiseptics, like creosote, which readily penetrate bacteria, do not affect spores.

It will be seen from this that the solubility of antiseptics in the outer layer of the protoplasm is the chief factor deciding rapidity of action and, therefore, their value. Lipoid-soluble substances are easily absorbed by bacteria, and this class includes most organic antiseptics, but none of the inorganic except perchloride of mercury and iodine. Carbolic acid dissolved in oil has no germicidal properties, because its affinity for the oil is so much greater than its affinity for cell lipoids, and even proteins diminish its action by diminishing its solubility in the cell lipoids. On the other hand, carbolic acid

and the other benzene derivatives like creosols in the presence of salts are more efficient germicides, because the carbolic acid now becomes less soluble in water and the phenol penetrates the cells in larger amount. So that the efficiency of an antiseptic not only varies with the concentration and duration of action, but with the chemical composition of the medium in which it acts, and in wounds and suppurating conditions the abundance of protein present renders valueless many antiseptics such as metallic salts. So many antiseptics have been employed from time to time, often under the dictates of fashion, for use in surgery that it will be possible here to touch briefly only on those of established value. These may be conveniently divided for description into groups.

The Coal-tar Group may be represented by carbolic acid as a typical member. It is stable, penetrates lipoids very readily and has some germicidal action, but it is not a highly effective germicide; it is irritant, perhaps in virtue of its property of precipitating proteins, it inhibits the formation of granulation tissue and if absorbed is poisonous; a 2 per cent. poultice applied to the skin too long leads to local gangrene. Phenol for antiseptic purposes should be dissolved in water; glycerine, alcohol, and especially oil detract from its antiseptic action. It is regarded as the standard antiseptic, since the ratio of the germicidal power of drugs to phenol under identical conditions represents what is termed the "phenol co-efficient"; thus the phenol co-efficient for picric acid used like iodine to sterilize the skin is about 5.

The creosols have a phenol co-efficient of 3 or 4, and are less toxic to body tissues than phenol; they are usually brought into solution by soft soap. β Naphthol and its derivatives have all been recommended from time to time as efficient antiseptics for

infected wounds, but their use is now discarded, largely on account of the difficulty of obtaining a suitable solution. Combination with sulphuric acid or glycuronic acids renders the coal-tar derivatives inert; the body-tissues detoxicate in this manner, and it follows that sulphonates and sulphocarbolates are valueless for antiseptic purposes.

Chlorine Derivatives.—Compounds in which some chlorine is "available" have become very popular as antiseptics, especially in the treatment of infected wounds. They have much to recommend them; they are non-poisonous, have little irritant action, and hardly affect leucocytes; they are powerful oxidizing agents and destroy toxins, and it has been frequently noted that the free application of these derivatives to infected wounds causes constitutional symptoms to disappear, though only to return when the treatment is stopped. Bleaching powder has long been known as a powerful germicide, but it was regarded as too irritant for use as an antiseptic for wounds. The addition of boric acid, however, to a solution of hypochloride renders it much less irritant, and has come to be known as eusol. The combination of hypochlorite with sodium bicarbonate is even superior to eusol; for general surgical purposes, such as irrigating wounds, the solution should contain about $\frac{1}{2}$ per cent. of sodium hypochlorite.

All proteins contain amino-acid groups, which, in contact with a solution of hypochlorite, react by substituting chlorine for the hydrogen of the $= NH$ group with the formation of compounds known as chloramines. The chlorination of bacteria is peculiarly deadly to them, and out of all proportion to the effect on mammalian tissues.

Hypochlorites in solution kill most pyogenic organisms in serum at a concentration of 1 in 1500. Blood when present decomposes the hypochlorites, so that as much as 1 in 300 may now be required to effect

a sterilization. The sodium hypochlorite solution is especially valuable for cleansing septic wounds, but, unfortunately, it quickly loses its action and requires frequent renewal, for the available chlorine disappears; it has the additional advantages that it dissolves necrosed tissues, is non-poisonous and cheap. These solutions are certainly more irritant to the skin than to the deeper tissues, and some care is required when the application is continuous.

Certain aromatic chloramines have the great advantage over sodium hypochlorite of being stable and forming soluble sodium salts. Benzene, sodium sulphochloramide, and p. toluene sulphochloramide are practically non-irritating, and can be used in much higher concentration than the hypochlorites. Their action is similar to the hypochlorites, but they are more powerfully antiseptic. The sodium salt of the latter substance is known as chloramine T. This body is readily soluble in water and, like the hypochlorites, attacks metals. In equi-molecular solutions it is less irritant and about four times as efficient a germicide as hypochlorite. It disinfects very rapidly, the maximum effect being reached a few minutes after application. For the treatment of wounds it is best employed as a 2 per cent. solution, and the action gradually disappears as the available chlorine is used, and the more rapidly if septic conditions obtain. A 5 per cent. gauze is suitable for packing septic cavities. It is especially vauable for the treatment of infected wounds and, on account of the absence of irritation, for injuries to the mouth and jaw. Ointments made with these substances are inert.

Dichloramines have also been much advocated, but it is difficult to find solvents for them which give satisfactory solutions, and they have no advantages over chloramine T.

The heavy metals are now much less used than formerly on account of their irritant properties and

their ready combination with proteins. They act more slowly than the chlorine derivatives, apparently on account of the time taken in forcing an entrance into the cell. Perchloride of mercury is an exception to this; it is soluble in lipoids and so penetrates more easily, a property which is not possessed by the other salts of mercury. Mercuric potassium iodide (biniodide) is less irritating than the chloride, but otherwise closely resembles it. Perchloride should be used with care in situations where absorption is likely to occur; even douching the vagina with dilute solutions has led to poisoning. It is now used principally to disinfect the hands; it preserves its disinfectant properties in oils and fats, but loses much of its effect in the presence of common salt. Silver salts, nitrate, cyanide, and organic compounds are inferior as disinfectants, to the mercury salts, and are employed rather for their astringent properties. Zinc salts are too irritant and destructive for general use. Bismuth paste, prepared by combining bismuth subnitrate 1 part, iodoform 2 parts with liquid paraffin, was largely used during the war in the treatment of both fresh and infected wounds. Suppurating wounds, after cleansing, are filled with the paste and dressed with gauze, and the dressing is kept on for several days if constitutional symptoms are absent. Further evidence to the value of this treatment is required.

Dyes and allied drugs have hardly fulfilled the high expectations anticipated for them; it will only be necessary to refer to two or three which are of undoubted value in surgery. Malachite green and brilliant green are used as general antiseptics, though used alone they are not very powerful germicides. Malachite green as a 2 per cent. solution in 80 per cent. alcohol mixed with a 2 per cent. solution of perchloride of mercury in 80 per cent. alcohol, forms a double compound which is dissociated by the tissues. The mixture is applied as a spray, and exerts little irritant

action; it is recommended for the treatment of superficial wounds, septic fractures, and burns, and is stated to be highly efficient. Scarlet red is an azodye used externally as a paste for promoting the growth of epithelium over granulating wounds. Acridine dyes call for more attention; they are usually termed Flavines. Acriflavine is the one usually used, proflavine is the diamino derivative and homoflavine the dimethyl derivative. All the flavines are powerful antiseptics, and have been used in the prophylactic treatment of wounds as well as in suppuration; they are said to be especially useful for the naso-pharynx and for washing out cavities. The rate of disinfection is not very rapid, but these bodies have the great advantage that the presence of serum increases the germicidal action, although the presence of pus greatly retards it. They are usually used as a 0·1 per cent. solution in normal saline. Flavines are much more effective as germicides in alkaline media, and their action is enhanced by light; they are not very poisonous substances, but are certainly not innocuous, and after the absorption of large doses in animals, nephritis and pulmonary œdema occur. The value of flavines in surgery has yet to be determined.

Miscellaneous antiseptics are very numerous, and have no chemical relationship with one another. Hydrogen peroxide is of little value as a germicide; its action is determined by the fact that blood, pus, and tissue proteins decompose it with the evolution of oxygen and the mechanical action of the liberated gas removes sticky adhesions and washes away pus. Permanganates, also oxidizing agents, are chiefly used for irrigation; they are mild germicides when no serum or pus is present, and are unsuitable for septic wound treatment. Iodine has much to recommend it, for disinfecting the skin a 2 or 3 per cent. in alcohol acts admirably, but for wounds it is too irritating, and after constant use severe after-effects, such as neuritis,

have been observed. Borates, perborates, and boric acid are only useful to prevent the growth of putrefactive organisms; they are not germicides.

Formic aldehyde is a slowly acting antiseptic; it has been used in a ½ per cent. solution for the disinfection of the hands, and to a smaller extent for mucous membranes, but it is not now used in the treatment of wounds. Iodoform owes its action to the gradual liberation of iodine in the presence of proteins, and this stimulates the growth of granulation tissue; iodoform has no germicidal properties.

Some hope exists regarding the future of certain quinine derivatives for general antiseptic purposes. Quinine is not very valuable, although mixtures of quinine and urea have been employed in the treatment of wounds in order to combine the local anæsthetic with the antiseptic properties, but it is now almost discarded. A quinine derivative iso-octylhydrocupreine (vuzin) kills streptococci in strengths of 1 in 80,000, and heptylhydrocupreine kills staphylococci in such dilutions as 1 in 64,000. Many laudatory reviews of these substances have been published from the clinics in Germany, but in this country they are almost untried.

Some of the most recently prepared acridine derivatives give even more favourable results against streptococci, and one of these, dioxydiamino acridine, has been introduced as a commercial product under the name of "rivanol."

No antiseptic can be regarded as the best; each has its special use; many are irritant, most are much weakened by the presence of protein, some are toxic after adsorption, and some have special affinities for certain micro-organisms. Few can doubt that the future of surgery in this respect lies in the laboratories of chemistry and pharmacology.

Anæsthetics in Common Operations.

By DUDLEY W. BUXTON, M.D., B.S., M.R.C.P.

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IT will be best in this Special Number to deal first with routine methods of giving anæsthetics in common operations, then emergency operations, and subsequently the types of patients which call for additional details in anæsthetizing, special selection of the anæsthetic, or adopting special precautions.

ROUTINE METHODS.

In the highest percentage of cases some method of employing ether will be adopted. The choice of method lies between (*a*) open drop ether from start to finish; (*b*) nitrous oxide gas followed by ether from a closed inhaler, such as Clover's, and this may be used throughout; or to produce induction while the maintenance of the anæsthesia is effected by the open drop method; (*c*) ether following some anæsthetic other than nitrous oxide, the best sequence being the A.C. mixture, *i.e.*, one volume of alcohol with nine volumes of chloroform, which may be exhibited by the drop method and the use of two Schimmelbusch's masks, one with a single layer of lint for the A.C. mixture and the other with twelve layers of gauze and one layer of lint, the latter being on the outside, and perforated by a window on which the drops fall.

If only one mask is available, the covers as described should be prepared, and as soon as the stage of excitement has developed, the lint cover is rapidly removed from the wire frame and replaced by the gauze cover.

The A.C. mixture behaves like chloroform but is safer; as in the case of chloroform, a mask covered with only one layer of lint must be used. However, the best method for this sequence is to employ a Shipway apparatus, and begin with A.C. following with ether. This plan has the material advantage of introducing a warmed vapour. Warmed anæsthetic vapours are more easily inhaled, less of the anæsthetic is used, and so after-effects are lessened.

There are two essentials to the routine employment of ether. These are (1) flooding the eyeball with *pure* castor oil so soon as the patient is sufficiently under the anæsthetic not to notice, and then placing either a cambric handkerchief or piece of lint, smooth side next to the eyeball, over the eyes (this prevents the ether vapour from causing conjunctivitis); (2) giving an hypodermic injection of an atropine salt (gr. $\frac{1}{100}$) one hour before the anæsthetic is to be given. This obviates the excessive secretion from the glands of the respiratory tract, a complication which so often causes duskiness, dyspnœa, and subsequent pulmonary sequelæ. It possesses the further advantage that, as there is practically no saliva or mucous secretion, the common cause of sickness—the swallowing of ether condensed in the upper air passages—is absent, and so post-anæsthetic vomiting is avoided.

It must never be forgotten that although no dramatic evil effects of giving either too concentrated a vapour or too prolonged an inhalation are witnessed, as would be the case under similar conditions if chloroform had been employed, yet overdosage with ether is often dangerous and always undesirable. The bad results of the overdosage reveal themselves, as a rule, after the operation is completed and not during the inhalation. These are exhaustion of the respiratory and circulatory systems following overstimulation, and those less dangerous, although distressing to the patient,

severe vomiting or persistent nausea, hiccough, headache, and malaise. The pulmonary after-effects from ether are really in most cases unnecessary, and follow what amounts to ether poisoning, rather than ether given in sufficient amount to ensure anæsthesia.

Another point of great surgical importance is that when the patient is over-stimulated by ether, his condition under the anæsthetic cloaks the evidence of shock arising from the surgical procedure, and the operator is often tempted to prolong the operation further than he would do if he were able to gauge the degree of shock existent. Be it remembered that the greater the amount of ether taken into the respiratory tract and the greater the adsorption into the body, the longer will be the stage of recovery and the greater the abstraction of heat from the pulmonary circulation. This loss of heat means shock, delayed convalescence, increased danger of pulmonary sequelæ, as well as those minor discomforts which are commonly called "after-effects." It is a great mistake to assume that serious "after-effects" are a necessary and unavoidable sequel to the inhalation of ether.

The limits of what should be considered routine cases are very wide, that is, so far as the patient is concerned. Special arrangements and procedures may be necessary in the following classes of cases: (*a*) severe shock, (*b*) ex-sanguined persons—*e.g.*, after repeated and severe uterine flooding; (*c*) septicæmic and pyæmic conditions; (*d*) cyanosed persons; (*e*) alcoholic, cholæmic, uræmic, and kindred blood states; (*f*) neurasthenics; (*g*) neurotics; (*h*) certain types of children. These will be considered in the sequel both as regards the choice of the anæsthetic to be given and the management of the agent selected.

ROUTINE OPERATIONS.

Posture.—The patient should lie upon his back,

except in cases to be indicated below. The head should be raised to a height which enables him to breathe easily and be in comfort. It is useful, when it is possible, to observe a patient's posture when lying at his ease in his bed, and to reproduce that position when he is placed upon the operation table. He should be given an hypodermic injection *one hour before* the inhalation is started. Provided no contra-indication exists, the following mixture may be injected: Atropine, gr. $\frac{1}{100}$, morphine gr. $\frac{1}{6}$ scopolamine gr. $\frac{1}{100}$. The scopolamine is not required for brief operations or for cases which cannot be watched by a nurse after the operation is ended, for it induces a prolonged and deep post-anæsthetic sleep, in which a patient may fall into a faulty posture interfering with breathing. It had best not be used in the case of children. The dose of morphine may be increased to gr. $\frac{1}{4}$ for persons of powerful physique and for alcoholics. These doses refer to adults, but gr. $\frac{1}{100}$ of atropine can and should be given to every patient, unless he is a baby or *very* young child. Whenever morphine or scopolamine has been given the patient should be kept absolutely quiet, no talking or moving, and placed in a darkened room for the hour before the operation. He *must be carried* and *not walk* from the bedroom to the operation room. If these precautions are not taken, the patient is liable to be roused and become faint.

Patients complain of backache after prolonged operations, and this can be obviated if a folded blanket is placed beneath the small of the back. The arms should be parallel to the trunk, and the hand, with the fingers spread, should be placed, palm downwards, beneath the buttocks, but this should not be done until the patient is unconscious. Unless the neck is very short and thick, the head should be lateralized, the face looking to the right, while the

chin is supported by the anæsthetist's hand as he steadies the mask. As regards struggling, usually none occurs unless the anæsthetic is given in too strong a vapour. It is best not to hold the hands or arms of the patient unless they are put up to seize the mask; holding down a conscious or semi-conscious patient alarms him, and suggests that he is going to be operated upon before he is fully unconscious. No moving of blankets and other interference, and no conversation or noisy moving of instruments should be permitted until full anæsthesia is established.

If the operation involves the lithotomy position, the strap which passes round the shoulders should be placed over the left shoulder and under the right armpit, otherwise undue pressure is exerted on the neck vessels. The thighs must not be flexed on the pelvis until the muscles are fully relaxed, and the limbs must not be flexed too much on the abdomen, for this, especially in stout subjects, interferes with breathing. Serious danger has followed neglect of this precaution. In the same manner, the knees should not be over-flexed, since pressure upon the popliteal space by a strap or support is dangerous, and may injure the popliteal vessels. This has occurred. It is wise to have the legs steadied by assistants when the operation is begun, especially if dilatation of the anus or insertion of a vaginal speculum is practised, since, in many persons, a powerful reflex occurs at this moment, and the limbs are more or less violently extended. Such holding becomes unnecessary during the succeeding steps of the operation. When an hypodermic injection has been given, the anæsthetist will not have the guidance of pupillary action and must rely upon the regularity of the breathing, the relaxation of the muscles, and slight stertor, as well as the loss of conjunctival reflex, as indications of the onset of complete anæsthesia. In

operations on the perinœum and genitalia, it is wise to allow some minutes of full anæsthesia to elapse before the operation is begun, for strong sensory stimuli from highly sensitive areas will awaken the patient, or lighten the narcosis if anæsthesia is only just obtained.

Semi-inverted Posture, Trendelenburg Position.—The head-down position is useful in many operations, such as those upon the pelvis. There are certain precautions necessary. Anæsthesia should be induced while the patient is horizontal; when complete, the head may be lowered and the pelvis and thighs raised. The arms must be so placed that there is no pressure upon them, such as occurs if they rest against the edge of the table and the surgeon or his assistant presses upon them. Raising the arms so that the forearms are above the head may cause pressure upon the brachial plexus; in the same way, turning a patient laterally so that the weight of the body is upon the lowermost arm will cause pressure. In any of these cases the musculo-spiral or other nerve may be so severely traumatized that a peripheral paralysis may result, which will not only alarm the patient but cause great suffering for many weeks. The semi-inverted position sometimes causes cyanosis and decided interference with respiration and even overfilling of the right heart. In extreme cases œdema appears in the loose tissues about the eyes, and this probably indicates œdema in the deeper tissues. The continued use of oxygen usually obviates the cyanosis, eases the respiration and heart, but in some instances it may be necessary to raise the trunk to the horizontal or nearly horizontal level. In no circumstances must cyanosis be neglected. However the condition may be due to the uptilt of the contents of the abdomen causing interference with the proper excursion of the diaphragm, and in this case, as soon as the abdomen is opened the intestines fall away

from the midriff and pressure is relieved. The tongue is very liable to fall back in the head-down position, and this will need attention.

Speaking generally, when the tongue has to be held forward, it is better to introduce a ligature through and from side to side of the tongue rather than to use a tongue clip. If this is done, there is no after-pain, provided the tongue is not strained too much forward. In pulling upon the tongue a cloth or pad of gauze should be placed over the lower teeth to prevent their tearing the loose tissue and veins on the lower surface of the tongue. The plan of introducing a wedge between the teeth (dental prop), as a routine measure before giving an anæsthetic, is undesirable; it gives discomfort and interferes with breathing. In edentulous and other cases, when the lips are sucked in and the nares are not fully patent, it is necessary as soon as the patient is unconscious to place a Doyen's gag between the gums and so maintain a sufficient airway. It may even be requisite to keep the tongue forward with its tip out of the mouth.

While upon the subject of posture, a few words may be said with regard to sitting a patient up in a chair. This may be done when nitrous oxide or ether is being administered, but it is far less safe if induction with chloroform is practised. In such a pose the patient is more liable to faint, and serious mishaps to circulation to occur.

For the *removal of tonsils and post-nasal adenoids*, nitrous oxide does not give sufficient time for a neat operation, besides which there is, under this anæsthetic, more venous engorgement than is desirable. Ethyl chloride in simple cases answers well for children, but, as with nitrous oxide, the time is brief, so that the mouth should be propped slightly open before the mask is applied, and air excluded by folding a towel over the mask. As soon as unconsciousness is secured,

the mask and towel are quickly laid aside, the gap opened to the required degree, and the operation performed. If a Doyen is used, no change of gag is necessary; if not, there should be two gags, and the second one inserted as soon as one tonsil has been removed, the first gag being slipped out. The patient should be lightly narcotized when the adenoids are removed, and as soon as the operation is completed the child should be turned and its pelvis rotated so that the face is well over the side of the couch, and the blood can come forward and out of the mouth.

Atropine, but not morphine nor scopolamine, should be given in such cases. The best method, however, is to induce with nitrous oxide or ethyl chloride and then give ether to full anæsthesia. This is necessary if complete tonsillectomy is aimed at, and the patient, unless feeble or very small, can be either well propped up on the couch or even placed in the sitting posture. For submucous resections, the sitting position materially helps the operator. In this case, since the procedure occupies several minutes, it will be necessary to maintain anæsthesia using a mouth-tube and a Shipway or Junker apparatus. Provided the amount given is kept within narrow limits and the airway is not impeded, the A.C. mixture or this mixed with ether may be used for keeping up the anæsthesia. At no time should the laryngeal reflex be allowed to be dulled, much less abolished. As a rule, if the nares are rendered bloodless, the hæmorrhage will not interfere with the airway patency. It is dangerous to use cocaine if chloroform is given, for when this is done ventricular fibrillation is liable to supervene. Ether used in oro-nasal operation need not and should not cause congestion or increased hæmorrhage. It is true that vascular dilatation is the result of the physiological action of ether, but it is a phenomenon of the early stage of the induction,

and if care is taken that plenty of air or, better still, oxygen is given simultaneously with the ether, the turgescence of the mucous membranes disappears before the patient is ready for operation. In such cases a fairly slow induction is an advantage.

In *Angina Ludovici*, when the structures of the neck are hard, brawny, and inelastic, if nitrous oxide or ether is given, there is the gravest danger of suffocation being caused. The A.C. mixture with oxygen should be used in such cases, and laryngeal catheters be in readiness to intubate and introduce oxygen if necessary. The same choice of anæsthetics should be made in dealing with foreign bodies in air-passages or œsophagus, and this is true for emergency tracheotomy or laryngotomy.

Extraction of Teeth may in difficult cases amount to an operation of no slight difficulty, and when conduction-analgesia or prolonged nasal gas proves insufficient or the apparatus for these methods are not available, the patient should have a preliminary injection of atropine, and ether should be given subsequently to full surgical anæsthesia. Chloroform, unless for subjects whose lung condition contra-indicates ether, should be avoided. The same procedure can be pursued as described above for submucous resections.

Setting of Fractures and Reduction of Dislocations.—There is a common but inaccurate belief that chloroform produces greater muscular relaxation than ether. The former anæsthetic does relax muscles more rapidly, but the latter ultimately produces a more complete muscular flaccidity. It is therefore better to begin the induction with the A.C. mixture, and pursue it with ether; the use of warmed vapours is most valuable in these cases. The preliminary giving of morphine and atropine hypodermically is usually of great assistance, especially in alcoholic subjects, for much of the spasms of the muscles is controlled by the

injection. It must be borne in mind that these patients commonly have food or alcohols in their stomach, so care must be taken that if sickness occurs the vomitus is not aspirated into the air passages. If this complication arises, the patient should be completely inverted, a gag introduced, the tongue held forward but not forcibly, and the back of the patient smartly struck. The fluid will drain out, and if solid material is ejected from the stomach, it can usually be wiped out of the fauces with the finger or a gauze mop. Failing these measures aspiration after tracheotomy must be adopted. If artificial respiration by compression is done, the effect will be to pump the material, which has entered the trachea, into the smaller bronchi and suffocation will be inevitable.

The only form of artificial respiration which is safe is what is termed perflation, *i.e.* aspiration through a tube passing through the larynx or tracheotomy opening and injection of oxygen or air through this tube. Such injection must not be forcible. The same line of treatment is called for if fluid from a vomica, pulmonary abscess, or empyema has flooded the sound lung. This accident occurs if during paracentesis thoracis the patient is turned over so that the sound lung is allowed to be below the diseased lung, *i.e.* below the level of the collection of fluid. In the case of an empyema this danger does not arise, unless there is a communication between the empyema and a bronchus. Another danger may occur in operations for the removal of large collections of fluid either from the abdomen or thorax. If such fluid is withdrawn rapidly, the displaced heart swings back into its normal position, and in some instances the heart ceases to function, so that the state of the circulation during such evacuations must be needfully watched.

Circumcision.—This minor operation done on children has led to many fatalities from the anæsthetic. The

child should be placed on a pillow, so that the drumming of the heels on a hard table may not occur and cause bruising. As children fear any apparatus, induction can be begun with a small mask or a handkerchief. A few drops of essential oil of bitter orange peel disguises the smell of the A.C. mixture, which last can be dropped or its vapour blown over if a Shipway inhaler is used. The child usually goes to sleep or becomes bemused, and then ether should be substituted for the chloroform mixture. Very deep narcosis should be avoided, but complete anæsthesia is essential. When the prepuce is seized, the legs are usually drawn up; this is a reflex, and does not evidence that anæsthesia is absent. If there is actual pain, the limbs are kicked about, the child cries and struggles, but such manifestations can only arise if the anæsthetist has mistaken sleep for the third degree—anæsthesia—of narcosis. The error is easily made, for the ocular phenomena of sleep in children are identical with those of anæsthesia. It is always wise to make sure of the true state of affairs by applying tentatively some slightly painful stimulus, *e.g.* pulling a few hairs. An operation should never be begun until full anæsthesia has been obtained. Nitrous oxide is not a good anæsthetic for these cases.

While upon this subject it may be pointed out that a common mistake is often made, which may lead to grave danger of overdosage, and this is that when anæsthesia is just attained, the operation is begun and the patient moves. In response to the demand for "more chloroform," the anæsthetist is prone to throw caution to the winds and pour on an excessive supply of the anæsthetic. This is incorrect procedure, and if it does not kill the patient, will lead to holding of the breath and respiratory spasm. The trouble is due to the blood of the patient not being sufficiently saturated, and so a powerful sensory stimulus being applied the

patient passes out of anæsthesia. The correct procedure is to stop the operation for a minute or so and continue the anæsthetic, but at the same level of strength, until the breathing is slightly and musically stertorous and regular, and the conjunctival reflex is lost. It is always advisable in doubtful cases to test the conjunctival reflex of each eye, for if the anæsthetist has been frequently testing one eye—always a mistake and unnecessary—the reflex disappears through exhaustion and before the centre is really anæsthetic.

Catheterization.—Avoid injecting cocaine into the urethra if chloroform is used; indeed, it is wiser to use novocain if an analgesic is considered necessary. Light narcosis is especially dangerous in all urethral operations, the induction should be prolonged and the narcosis deep, *i.e.*, absolute anæsthesia is essential. This applies equally to vaginal cases.

The *Radical Cure of Hernia* calls for no special mention, except to say that it may be done under special anæsthesia, local analgesia, or general (ether) anæsthesia. The consensus of opinion about spinal anæsthesia is that when it is used for hernia, acute abdomens, and so on, it is always wise to associate it with a general anæsthetic to avoid the dangers of psychic shock. Cases have occurred in which a patient, although insentient after intrathecal injection, became maniacal for weeks as the result of mental stress.

Appendectomy.—The difficulty arising in these cases is the board-like rigidity of the muscles overlying the diseased area. As Hilton showed in his classic *Rest and Pain*, a rigid muscle over a painful area is a protective reflex. The preliminary use of morphine, scopolamine, *and atropine* is essential, followed by ether introduced by nitrous oxide or, better, by A.C. The patient must be thoroughly under, the breathing slow and regular, and the conjunctival reflex in abeyance before the operation is begun. In the case

of an abscess having formed, chloroform must not be given, for in all septic cases that anæsthetic is contra-indicated since it delays healing, and is liable to produce post-operative acidosis and acidæmia.

The most usual cause of rigidity is deficient oxygen, so if the patient is at all dusky and the lung ventilation is poor, the anæsthetic should be given more sparingly, oxygen should be administered with it, and the thorax compressed by the flat of the hand with each inspiration. Excessive strength of anæsthetic vapour also causes holding of the breath, and concomitant lessened vigour of respiration. The posture should be noticed, and if the tongue is retracted it should be brought forward. These minor complications are especially likely to occur if morphine has been given, since one of its effects is to diminish the activity of the respiratory centre. Scopolamine and atropine in some measure counteract this, hence the value of the combination. When a purely open ether method is adopted for cases calling for complete relaxation, difficulties often arise, for the strength of ether vapour supplied by this method is necessarily low. To obviate this drawback a more prolonged induction is called for, and greater exclusion of air needed. Certain types of patients need special treatment so far as the anæsthetic is concerned.

Shock.—The patient is commonly only semi-conscious and very little anæsthetic is wanted, sometimes not any is required. When there has been much loss of blood, either due to trauma or disease, *e.g.*, uterine myoma, ether should be used, but as sparingly as possible consistent with complete anæsthesia. Chloroform is usually contra-indicated in shock, unless there is danger of the recurrence of hæmorrhage taking place when the circulation is stimulated by the ether. In these cases oxygen, given with the ether, is of the utmost value, and in very pronounced shock, the

oxygen should be passed through a Woolff's bottle containing alcohol. The best posture for shocked patients is to have the feet raised and head depressed, whilst every effort should be made to raise the body-temperature by heating the operation-room, covering the limbs and chest of the patient with a cotton wool (Gamgee) jacket, and the use of well-guarded hot-water bottles applied to the flanks, thighs, and feet.

These measures apply equally to ex-sanguined patients, but such additional aids to recovery as intestinal infusion of physiological saline containing 6 per cent. gum solution (Bayliss), rectal injections of warmed saline in which is dissolved glucose (1 oz. to 6 oz. of saline), may be adopted. Massive clysters are useless, but rectal irrigation is valuable. With regard to septic conditions, the main points to bear in mind are that chloroform must not be used, and every assistance should be given to the heart, since it is usually liable to acute dilatation in such cases, especially during the inhalation of nitrous oxide gas.

Cyanosis.—Extreme degrees of this disease hardly come within the scope of the present paper, but patients, whose blood is imperfectly oxygenated as a result of valvular or other disease, may be considered under this caption. The selection and management of the anæsthetic resolve themselves into a careful study of the pathological conditions causing the cyanosis and the treatment appropriate to each. If it is due to a lung condition, the dosemetric chloroform with oxygen method is called for and great care exercised that the airways are kept free, especially as there is usually a tendency to excessive secretion of mucus and saliva in this state. This can usually be prevented by an anticipatory injection of atropine. Both nitrous oxide and ether are contra-indicated.

In *cholæmia, uræmia, glycosuria,* and other blood-states, great risks are run when a general anæsthetic

is given. In hepatic cases, chloroform is not good, nor should it be used if there is much sugar in the urine. Moderate degrees of albuminuria do not contra-indicate ether or nitrous oxide with oxygen. Anæmia very often gives great trouble, for circulatory failure is peculiarly liable to occur. Under "gas" the recovery is very rapid, so that for brief operations it is best to give this anæsthetic in sequence with ether, if possible employing warmed vapours.

Neurotics, neuropaths, and highly nervous persons, especially if there is functional tachycardia, are best dealt with by a hypnotic given the night before the operation to insure sleep, a sufficient dose of scopolamine, atropine, and morphine one hour or one hour and a half before the inhalation; the dose will depend upon the individual and whether he is habituated to drugs, followed by the nitrous oxide with oxygen and ether sequence. These persons should be well under the anæsthetic before the operation is begun, and if possible should be anæsthetized in a room other than that in which the operation is to take place. They should not be given alcohol before the anæsthetic, but if a stimulant is craved for, white sugar in carefully flavoured water to simulate alcohol may be given just before the hypodermic. The horizontal posture is important, although when returned to their bed the head and shoulders should be raised.

Alcoholics are best managed by a rapid induction, and this is best achieved by the use of nitrous oxide and oxygen, to be followed by ether. It is very important to avoid cyanosis. Although these persons are difficult to anæsthetize and when anæsthetized to keep immobilized, it must be remembered that this difficulty is not due to their tolerance of the anæsthetic. The nervous system is hard to put to sleep, but the heart and lungs usually are easily poisoned by excessive strength or dose of the anæsthetic. It is necessary

to delay all operative measures for quite a long time, say a quarter of an hour, after the usual signs of anæsthesia have emerged. They, like persons who smoke excessively, should knock off alcohol and tobacco for some days before the anæsthetic is given.

Certain Types of Children.—We now recognize that children enjoy no immunity from the perils of anæsthesia. In the first place they are liable to suffer from that complex of symptoms which we speak of as lymphatism or status lymphaticus, and post-operative acidosis (so called delayed chloroform poisoning), as well as being peculiarly prone to fear, shock, and loss of bodily temperature. The danger of lymphatism is probably less than commonly believed, since moderate degrees of lymphatic hypertrophy are comparatively common while fatalities are rare. If there are pretty definite symptoms suggesting this condition, a change to the seaside with good food, exercise, and tonic treatment are a useful preliminary before any operation on the child is carried out. Everything should be done to avoid "terror," a child's greatest danger, and easily assimilated food may be given two hours before the anæsthetic. The anatomical condition obtaining in the subjects of lymphatism indicates that these children cannot take an average dose of an anæsthetic with impunity, so the anæsthetist must feel his way and note any weakening of the respiration or heart. On the other hand an incomplete anæsthesia is a great danger. Ether is safer in these cases than chloroform certainly for induction, and children take ether well if there has been a preliminary injection of atropine. The ether may be introduced by gas or a little essence of orange peel. Children must be kept very warm throughout the anæsthesia and during the period of recovery.

APPOINTMENTS.

No charge is made for the insertion of these notices: the necessary details should be sent before the 14th of each month to The Editor, THE PRACTITIONER, Howard Street, Strand, London, W.C. 2, to secure inclusion.

ABEL, A. L., M.S. Lond., F.R.C.S. Eng., appointed Honorary Surgeon to Out-patients at the London Lock Hospital, Dean Street, W.

APPLEYARD, W., M.B., B.S. Lond., F.R.C.S. Eng., appointed Honorary Acting Consulting Laryngologist to the Royal Infirmary, Bradford.

BROWN, J. JOPLING, M.S., F.R.C.S.E., appointed Hon. Surgeon, Newton Abbot General Hospital, District Medical Officer, Public Vaccinator and Medical Officer for Scattered Homes, Newton Abbot.

BROWN R. C., M.B., B.S. Durh., appointed Tutor in Obstetrics at Leeds University and Resident Medical Officer, Leeds Maternity Hospital.

BROWN, W., M.D. Oxf., appointed Honorary Consulting Psychologist, Bethlem Royal Hospital.

CAMPBELL, WILLIAM S., M.D., C.M. Edin., appointed Honorary Surgeon, Victoria Cottage Hospital, Sidmouth.

CAVENAGH, J.B., M.B., Ch. B. Oxon., appointed Honorary Surgeon in Charge Ear, Nose and Throat Department, General Infirmary, Worcester.

CHANDLER, F. G., M.D. Camb., M.R.C.P. Lond., appointed Assistant Physician to Charing Cross Hospital.

DIAS, D. A., L.R.C.P., L.R.C.S. Edin., L.R.F.P.S. Glasg., L.D.S. Liverpool, appointed House Surgeon to the Eccles and Patricroft Hospital.

EDWARDS, P. W., M.B., Ch.B. Edin., appointed Medical Superintendent of Prestwood House, near Stourbridge, and Visiting Physician to the Limes, Hinley and Edge View Hospital, Kinver.

FLEMING, MISS A. MARGARET, M.B., B.Ch., appointed Assistant in the Anatomy Department, University of Glasgow.

FULLER, A. R., M.R.C.S., L.R.C.P., appointed Certifying Factory Surgeon for the Perranporth District, co. Cornwall.

FULTON, T. F. S., M.B., B.Ch., B.A.O., D.P.H., appointed School Medical Officer, Belfast.

GILCHRIST, A. RAE, M.B. Edin., appointed House Physician to the East London Hospital for Children.

GROSS, MALCOLM, M.B., B.S. Lond., D.P.H., appointed Assistant Medical Officer of Health, County of West Suffolk.

HICKMAN, Miss E. M., M.B., Ch.B. Leeds, appointed Demonstrator in the Department of Pathology and Bacteriology, University of Leeds.

HILLS, HAROLD W., M.B., B.S. Lond., appointed Certifying Factory Surgeon for the Stroud District, co. Gloucester.

KILLICK, CHARLES, M.D.Cantab., F.R.G.S. Eng., appointed Honorary Consulting Ophthalmic Surgeon to the Royal Infirmary, Bradford.

MARTIN, A. A., T.D., M.D. Lond., B.S., M.R.C.S., appointed Supervisor of the War Pensions Clinic at Eastbourne.

ODDY, H.M., M.A., M.B., B.Ch. Oxon., M.R.C.P. Lond., appointed Physician to Out-Patients, Hampstead General and N.W. London Hospital.

QUINE, W. J. A., M.B., B.S. Lond., appointed Port Medical Officer of Health for Plymouth.

SHATTOCK, C. E., M.D., M.S. Lond., F.R.C.S. Eng., appointed Assistant Surgeon to the Cancer Hospital, Fulham Road.

SURRAGE, H. J., M.R.C.S. Eng., L.R.C.P. Lond., appointed Anæsthetist at the Chelsea Hospital for Women.

WALLACE, W.H., M.B., Ch.B. Glasg., appointed Deputy Medical Superintendent at Wingrove Hospital, Newcastle-on-Tyne.

WILLIS, F. E. S., M.D. Lond., M.R.C.P. Lond., appointed Physician to Out-patients, Hampstead General and North-West London Hospital.

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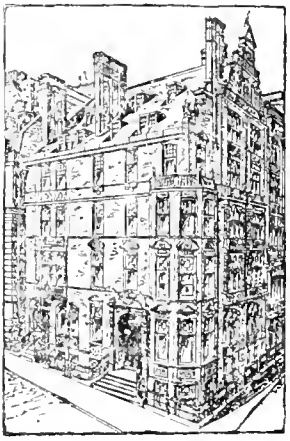

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